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INDEX ISSUE

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- 2** **Firearm Mortality Among Persons Aged 1-34.** In 1988 more than half of the 30,000 lives lost to firearms were in this age group.
- 13** **Impact of Fraudulent Claims on Health Care Costs**
- 21** **1990 Census Results**
- 28** **Charges for Substance Abuse Hospitalization: Regional Variations 1990**

 **MetLife®**

Contents

Statistical Bulletin Vol. 72, No. 4, Oct-Dec 1991

- 1 From the Editor's Desk
 - 2 Firearm Mortality Among Persons Aged 1 to 34
 - 12 Commentary: Violent Deaths in the United States: A Need to Know More
*Lois A. Fingerhut, Office of Analysis and Epidemiology
National Center for Health Statistics*
 - 13 Impact of Fraudulent Claims on Health Care Costs
Sarah Kelly, Vice-President, Group Claims Operations, Metropolitan Life
 - 14 The Context of Fraud
 - 20 Reporter's Notebook: AIDS Conference
 - 21 1990 Census Results
 - 22 Rejected 1990 Census Revision
 - 28 Charges for Substance Abuse Hospitalization: Regional Variations, 1990
 - 33 Background: Substance Abuse Hospitalization Costs
 - 34 Contents and Index: 1991
- Back Cover: Historical Perspectives

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From the Editor's Desk

Firearm violence in America takes a terrible toll. As *SB*'s lead article and Commentary explain, firearms cause more than 30,000 deaths each year, with more than half among persons under 35 years old. Without much fanfare about the long-term social destructiveness of this epidemic, the essential statistic is that 15 percent of all deaths in the United States under age 35 are from guns. Firearm homicide rate among adolescent American males, 15-19 years, has risen 67 percent between 1984 and 1988. Geographically, deaths from firearms among white youth are highest in Texas, New York and Florida; among African-American youth they are highest in Michigan, the District of Columbia and California.

Where Is the Outcry?

With firearm deaths rising since 1984, we ask: Where is the great public outcry against continuance of this plague? The answer cannot be lack of general public information because there are daily media reports on firearm-related deaths. Regardless, as our article describes, the carnage continues.

SB views firearm deaths as alarming. Further, our legislative bodies need to assure the health and well-being of the next adult generation with regard to this problem by working aggressively to remove the pervasive fear of firearm violence in this country.

Public Health Controls Needed

Public health controls must be enacted with enforcement provisions in the same way that laws protected the public by pasteurization of milk and by chlorinated water supplies in the 19th century. If such controls are not enacted, how will future generations grade our performance? A "D minus" is probably generous.

Whose problem is this to solve? It is a cliché in the public health field that leadership is hard to find for a problem that affects everyone. For years that was true for risk factors such as dietary fat in cardiovascular disease, alcohol in injury-prevention and tobacco in multiple diseases, but now that has changed. Can't firearms find national policy leadership with the courage to make our children's lives—as well as our nation's future—safe and secure?

Time for Legislative Action

What can be done? The legislative process is the common denominator for social change. It tends to be reactive, however. In the absence of strong public voices, legislative bodies frequently follow vested interests. While that once may have been tolerable, it is not tolerable now. Let's have an end to this "warring madness."

On that passionately felt note, I wish you good reading. □

Charles B Arnold

The Statistical Bulletin will publish comment and criticism from readers about its contents. Alternate interpretations of data analyses or different points of view about subjects are particularly welcome. Use address at end of publisher's statement, opposite page.

Firearm Mortality Among Persons Aged 1 to 34

RECAP

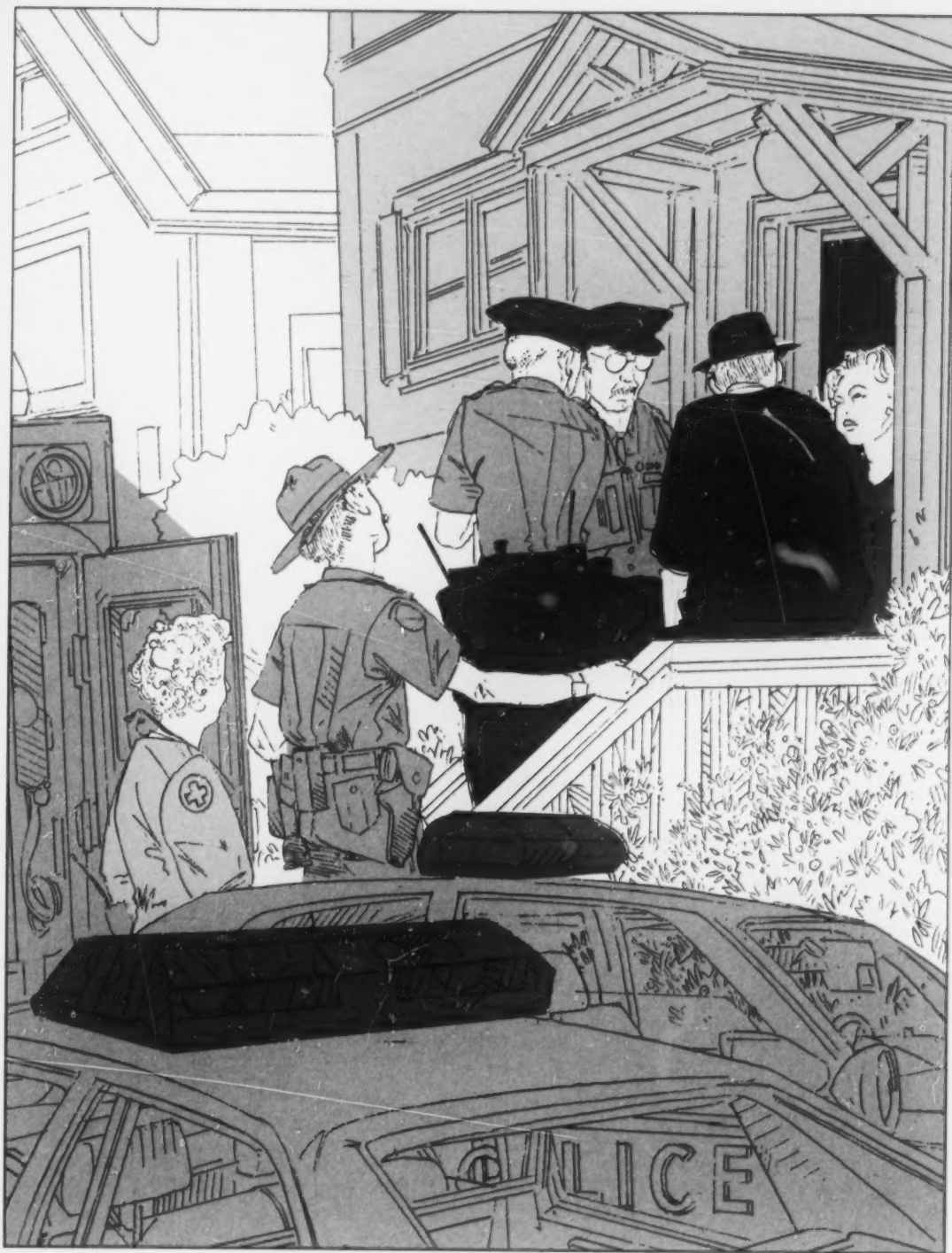
Firearm Mortality

Firearms claim more than 30,000 lives each year in the United States. In 1988 more than half of these deaths were among ages 1-34, with firearms accounting for 15 percent of all deaths in this age group. Total firearm deaths, as well as firearm homicide rates, have been increasing since 1984, taking a disproportionate toll on America's minority youth. The firearm homicide rate among all adolescents aged 15-19 rose 67 percent between 1984 and 1988. Among blacks aged 15-24, the firearm homicide rate was 72.0 per 100,000 during 1986-88 versus 8.1 among white males of this age. Geographic differences also exist, with Texas, California and New York leading in firearm homicides among white males aged 15-24, and Michigan, D.C., and California leading among blacks of this age. □

Firearms continue to claim alarming numbers of lives each year in the United States. Despite public outrage and various attempts at curbing violence and firearm accessibility, the killings continue. Also, the deaths increasingly are disproportionately found in minority communities and the victims seem to be becoming younger and younger.¹⁻³ Reports estimate that as many as 10 children under age 19 die daily as the result of a handgun-associated homicide, suicide or accident, while countless more are wounded from these and other types of firearms.⁴ Further, firearms remain second only to motor vehicles as a major cause of all U.S. injury deaths.²

In 1988, the latest year for which final data are available, close to 34,000 people died as the result of firearms in the United States. The firearm death rate per 100,000 was 13.7, with 51 percent of firearm fatalities (17,249 deaths) occurring among persons aged 1-34. Within this age group, firearms accounted for 15 percent of the deaths and 20 percent of deaths among ages 15 to 24.¹ Between ages 1 and 34, the 1988 rate reached a high of 23.9 per 100,000 among 20-to-24-year-olds. The firearm death rate rose significantly between 1987 and 1988 in all but the 5-9 age group, where it remained stable at 0.7 per 100,000. The largest relative increase was among all 15-to-19-year-olds, where there was a 20 percent increase in the 1988 rate. Among males in this age group, however, the rate rose 35 percent for blacks and 15 percent for whites, to 79.5 and 21.7 per 100,000, respectively.

Homicides predominate as the major cause of firearm fatalities among ages 1-34. Suicides account for the second largest proportion of firearm deaths in each age group except ages 1-14, where unintentional causes are second.¹ Virtually



David Johnson

**Table 1—Trends in Firearm Mortality Rates
Ages 1-34, by Race and Sex
United States, 1979-1988**

	(Rate per 100,000)					
	Ages 1-34*	Ages 1-14	Ages 15-19	Ages 20-24	Ages 25-29	Ages 30-34
All Races						
1979	13.1	1.5	14.0	24.8	24.5	21.2
1980	13.6	1.4	14.5	26.1	25.9	21.9
1981	13.2	1.3	14.3	24.8	25.2	21.7
1982	12.3	1.4	13.5	22.4	23.1	20.6
1983	11.4	1.4	12.4	20.8	21.0	19.1
1984	11.0	1.2	12.4	20.8	20.3	18.0
1985	11.1	1.3	13.3	20.6	20.2	17.6
1986	12.0	1.4	14.5	23.0	21.0	19.0
1987	11.7	1.4	14.7	22.8	20.2	17.7
1988	12.7	1.5	17.7	23.9	21.6	18.3
White Male						
1979	17.1	2.0	20.0	32.8	30.8	27.0
1980	18.1	1.9	20.7	35.3	33.1	28.2
1981	17.5	1.7	20.1	33.3	32.3	28.1
1982	16.7	1.9	19.4	30.9	30.4	26.9
1983	15.6	1.7	17.7	28.7	28.5	26.5
1984	15.6	2.1	17.8	29.1	28.0	24.8
1985	15.5	2.1	18.5	29.3	27.8	23.5
1986	16.2	1.9	20.2	31.0	27.0	25.8
1987	15.3	1.9	18.9	29.2	26.4	23.6
1988	15.9	1.8	21.7	29.8	27.1	23.5
Black Male						
1979	58.2	3.0	42.5	103.3	126.8	118.8
1980	60.7	3.0	45.5	111.3	133.4	117.4
1981	56.4	3.5	44.1	98.6	122.8	111.4
1982	49.4	2.5	40.8	83.2	105.2	102.5
1983	42.7	2.0	37.9	79.4	86.7	82.3
1984	40.4	2.0	35.8	74.8	84.6	75.2
1985	41.6	2.6	45.4	75.7	78.6	76.3
1986	48.6	2.6	48.5	95.4	97.1	82.3
1987	49.6	3.4	58.9	103.9	87.2	75.7
1988	58.9	3.9	79.5	119.2	103.2	84.3
White Female						
1979	3.5	0.6	3.9	6.6	6.3	5.5
1980	3.5	0.6	4.1	6.1	6.0	6.0
1981	3.8	0.7	4.2	6.6	7.1	6.1
1982	3.6	0.7	3.8	6.4	6.6	5.7
1983	3.3	0.6	3.6	5.6	6.2	5.4
1984	3.3	0.7	3.8	6.1	5.1	5.5
1985	3.2	0.7	3.5	5.3	5.8	5.5
1986	3.2	0.6	3.7	5.7	5.6	5.3
1987	3.1	0.6	3.3	5.2	5.6	5.3
1988	3.1	0.6	3.8	4.5	5.6	5.2
Black Female						
1979	9.3	1.4	8.6	17.4	17.3	16.2
1980	9.4	1.1	7.5	17.4	19.2	17.3
1981	8.6	1.3	7.6	16.7	15.8	15.0
1982	6.9	0.8	6.4	11.6	13.4	13.6
1983	6.6	0.9	5.9	12.4	12.3	12.2
1984	6.5	1.2	6.2	11.1	13.2	10.5
1985	6.4	0.9	6.0	10.3	13.1	12.2
1986	7.4	1.3	7.8	12.0	14.5	12.7
1987	7.8	0.9	9.0	13.9	14.6	13.0
1988	8.3	1.8	8.4	13.9	16.0	12.8

*Adjusted on basis of age distribution of the United States total population, 1940. Source of basic data: National Center for Health Statistics, Division of Analysis. Rates for 5-year age groups computed by the personnel in the Office of Analysis and Epidemiology; rates for ages 1-34 and 1-14 computed by the Health and Safety Education Division personnel of the Metropolitan Life Insurance Company.

three-fifths of all U.S. homicides are caused by guns, with knives or other cutting/piercing instruments following in second place with another fifth.² Males substantially outnumber females in firearm homicides particularly among ages 15 to 34 where the ratio is at least 4.5 to 1. In 1988, 31 percent of all firearm homicides were among 15-to-24-year-olds. Homicides are the leading cause of death among black males 15-24, and third among whites of this age.⁵ As with total firearm deaths, firearm homicide rates are rising particularly fast. Among all persons aged 15 to 19, the rate has increased 67 percent since 1984.¹

Between 1987 and 1988, 15-to-19-year-olds experienced the largest relative increase in firearm death rates.

These and similarly disturbing statistics have increasingly been the subject of study, scientific conferences and professional and media reporting.^{3,6-8} While firearm deaths are gaining recognition as a major public health issue, means of controlling the problem remain elusive. Recognizing this, health officials in the late 1970s included the reduction of homicide and violence among the "Health Objectives for the Nation." The goal for the year 2000 is to reduce the homicide rate to 7.2 per 100,000 population—a decrease of 20 percent from the 1988 rate of 9.0.⁹ Among the special population groups targeted for reduction in homicides are children, blacks of both sexes between ages 15-34 and Hispanic males in this age group.

MetLife Study

The following analysis is presented in an effort to help focus attention on the complex

public health and social issue of firearm mortality among the young. It builds on the latest work of the National Center for Health Statistics (NCHS) by summarizing selective data from its most recent publication on firearm deaths among ages 1-34,¹ and by presenting unpublished data from NCHS, Office of Analysis and Epidemiology, on firearm homicides among those most affected—America's 15-to-24-year-old males.

Homicides are the leading cause of death among black males 15-24 and third among whites of this age.

Trends in Rates

As is clear from Table 1, elevated firearm mortality rates persist among Americans aged 1-34. The problem is particularly acute among blacks of both sexes, however. In 1988 the age-adjusted rates for both black men and black women were two to four times those for whites. Further, the latest age-adjusted black male firearm mortality rate is approaching the 1980 high of 60.7 per 100,000 population, whereas the rate for white men is the fourth lowest in 10 years (15.9 per 100,000). Except for 1980, the rates declined among black men between 1979 and 1984 but have increased each year since. The age-adjusted rates among black females, 1-34, dropped in a similar fashion, only to begin rising in 1986.

In contrast, white males have experienced a general downward trend in firearm mortality rates since 1979. With the exception of a 5 percent increase in 1986 and a 4 percent increase in 1988, the age-adjusted rates for white men, 1-34, have been slowly decreasing to a point 7 percent lower than in 1979. While white females aged 1-34 experienced a 9 percent

increase in their firearm mortality rate in 1981, their age-adjusted rates have been dropping since, and now are the lowest in 10 years—3.1 per 100,000. This low rate is 11 percent lower than their rate in 1979, and 63 percent below the rates among their black counterparts.

Firearm mortality rates are highest among men aged 20-24 of both races (Figure A). While the rates have fluctuated over the years within age, sex and racial groups, the latest rates have tended to be lower than those in 1979. The major exceptions are black adolescent males (ages 15-19) and black men 20 to 24. For the adolescent black males, the rates have almost doubled since 1979 (Table 1). Rates increased 15 percent among black men aged 20-24 during that time. (The rates among adolescent white males have increased only 9 percent over the 10-year period.)

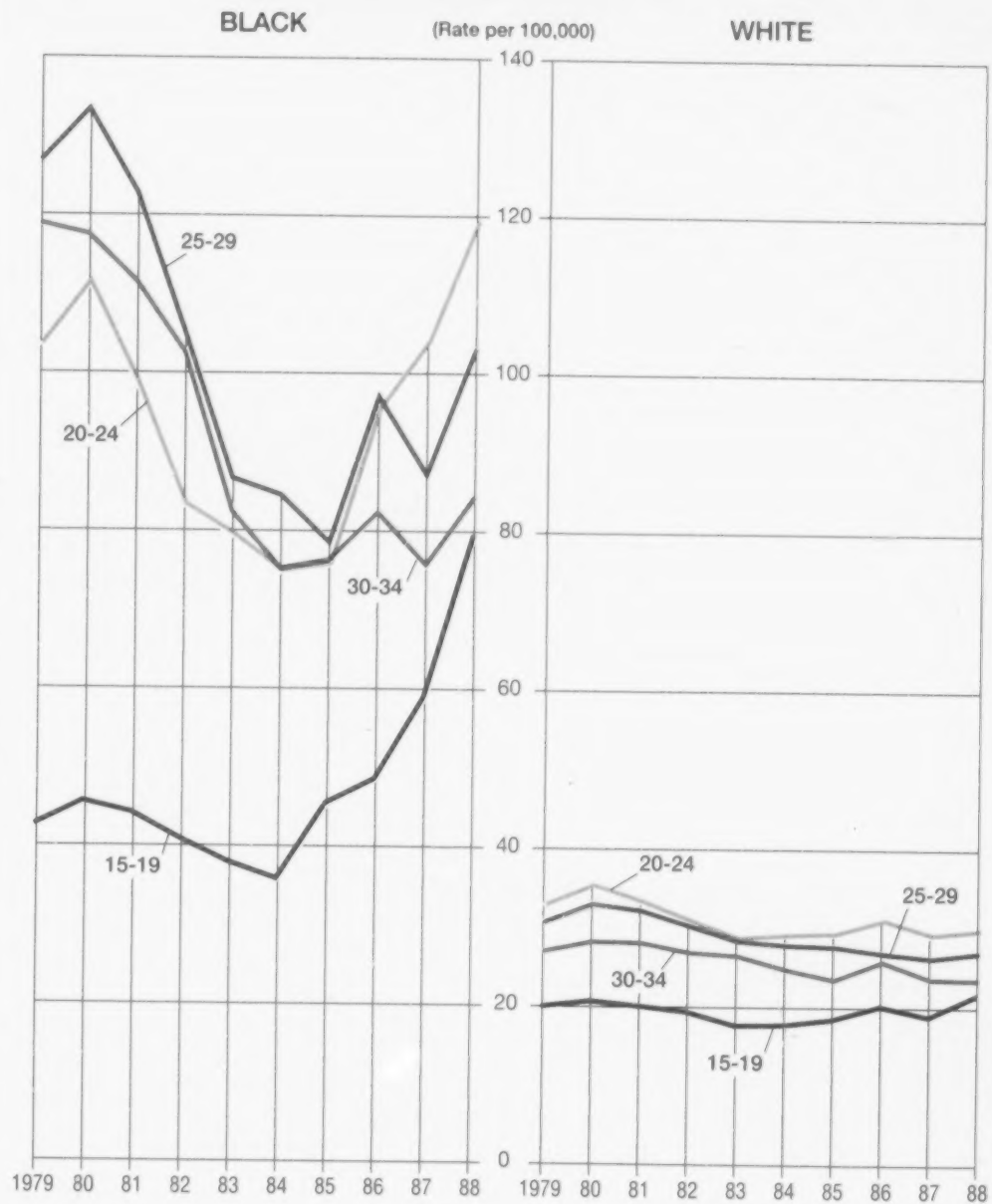
Racial Differences

The disproportionate toll firearms take on blacks is also shown in Figure B. Close to half (48 percent) of all the 1988 deaths among black males aged 15-19 were the result of a firearm injury, versus 18 percent among the whites. The proportion drops to 42 percent among 20-to-24-year-old black males, but remains more than twice that of the white males in this age group. With the exception of ages 30-34, the percentage of total deaths due to firearms is also higher among black females than whites at all ages. The largest disparity is at ages 15-19, where 17 percent of black female deaths were firearm-related, compared with 8 percent among whites.

Rates Among Young Men

Because of the large increase in firearm deaths among males aged 15-24 and because more than half of all firearm deaths in this age group are classified as homicides, firearm homicides among these young men have been reviewed

**Figure A—Firearm Mortality Rates for Males
Aged 15-34 by Race, United States, 1979 to 1988**



Source: Table 1.

Firearm Mortality Among Persons Aged 1 to 34

separately.* Unpublished data for the three-year period, 1986-88, for black and white males aged 15-24 were supplied by the Office of Analysis and Epidemiology of the NCHS. The deaths and populations were combined for the three years in order to provide stable estimates. Thus, state specific rates are restricted to those 42 states with populations, in 1988, of at least 65,000 white males aged 15-24, and to those 31 states plus the District of Columbia with populations of at least 10,000 black males in this age category.

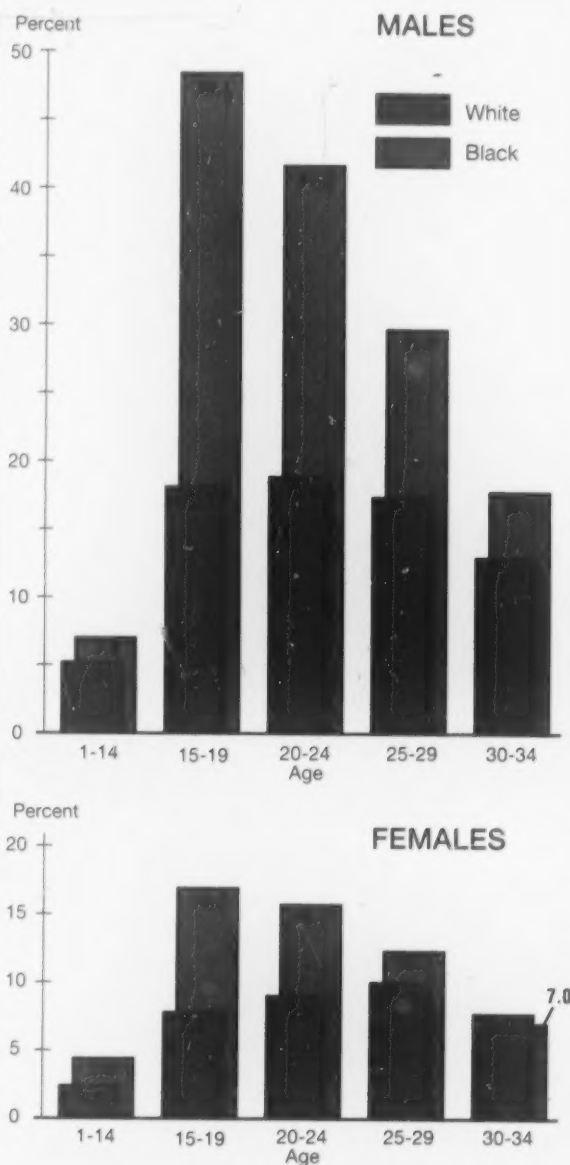
Close to half of all 1988 deaths among black males aged 15-19 were the result of a firearm injury.

Homicide Rate

The overrepresentation of blacks among homicide victims, in general, and firearm homicide victims, in particular, is apparent in Table 2. During 1986-88, more than half (57 percent) of the homicides among white and black 15-to-24-year-old males were among blacks and three-fifths of the *firearm homicides* were among these young black males. Further, the firearm homicide rate for these young black men was close to nine times higher than that for their white counterparts (72.0 versus 8.1, respectively). Even more devastating, the 1986-88 firearm homicide rate among young blacks was close to 50 percent higher than that for 1983-1985 (48.1 per 100,000) in contrast to the 8 percent increase among whites of this age (data not shown). In addition,

*Homicide deaths are those assigned to *International Classification of Diseases*, Ninth Revision, Codes E960-E978, with *firearm homicide* Codes of E965.0 through E965.4.

Figure B—Firearm Deaths as Percent of All Deaths, Ages 1-34 by Race and Sex, United States, 1988



Source: Reports from the National Center for Health Statistics.

81 percent of the homicides among blacks aged 15-24 were due to firearms, compared with 69 percent among the white homicides.

Geographic Differences

Table 2 also shows marked geographic differences in firearm homicide rates among these males. The white rates were higher than the U.S. average in 11 states ranging from 1.2 percent higher in Alabama to

During 1986-88, 11 states reported firearm homicide rates among young white males higher than the U.S. average.

101.2 percent higher in Texas. Five states—Texas, California, New Mexico, New York and Florida—reported total homicide rates among young white men 34 percent or more above the nation's average (Figure C). Together, these states accounted for 56 percent of all homicides during 1986-88. Among the states with the highest firearm homicide rates among whites, Texas is notable because it is the only one where the rate has been dropping since 1980. Its latest rate was 13 percent lower than that in 1983-85 and 29 percent below its 1980-82 rate (earlier data not shown).

Seven states reported firearm homicide rates less than 2.5 per 100,000, or at least 69 percent below the U.S. total for these white men. (See Table 2.) The deaths totaled 133 over the three years, with the vast majority (71 percent) being reported in the North Central area of the country. (Note that the Maine and New Hampshire rates are based on only five and four total firearm homicides, respectively.) Minnesota reported both the lowest firearm and non-firearm homicide

rates among white males ages 15-24, 1.0 per 100,000 in each category. The Minnesota firearm homicide rate was 41 percent lower than the second lowest rate, which was reported in New Hampshire.

For the young black men, seven states plus the District of Columbia reported firearm homicide rates in excess of the average for the nation (Figure D). The highest rate was Michigan's 180.7 per 100,000 population, which was two and one-half times the U.S. average for these young blacks and 37 times that among their white counterparts. This rate increased 54 percent over that reported in 1983-85, 117.2 per 100,000 (data not shown). It should be noted that the non-firearm homicide rate in Michigan was the third highest among these black men, producing a total homicide rate for black males, 15-24, close to 210 per 100,000. The second highest firearm homicide rate for the young black males was reported in D.C. Not only was the D.C. rate 90 percent above the national rate, but it also represents a 96 percent increase over its 1983-85 rate (data not shown). Firearm plus non-firearm homicides in D.C. produced a total rate of 168.3 per 100,000. Firearm homicides in the five states and D.C., with rates above 100 per 100,000, totaled 3,026, or 51 percent of all the black firearm homicides during 1986-88. Two states, i.e., Michigan and New York, plus the District of Columbia, were among the top five states in both firearm and non-firearm homicide rates.

The five lowest firearm homicide rates for these black men were registered in Delaware, South Carolina, Mississippi, North Carolina and Kentucky, each with rates under 27 per 100,000, or at least 60 percent lower than the U.S. total for these men. Non-firearm homicide rates were similarly low in these states with the exception of Mississippi.

Over the years, the United States has experienced a variety of major public

Table 2—Homicides From Firearms Among Males Aged 15-24 by Race, United States, 1986-88

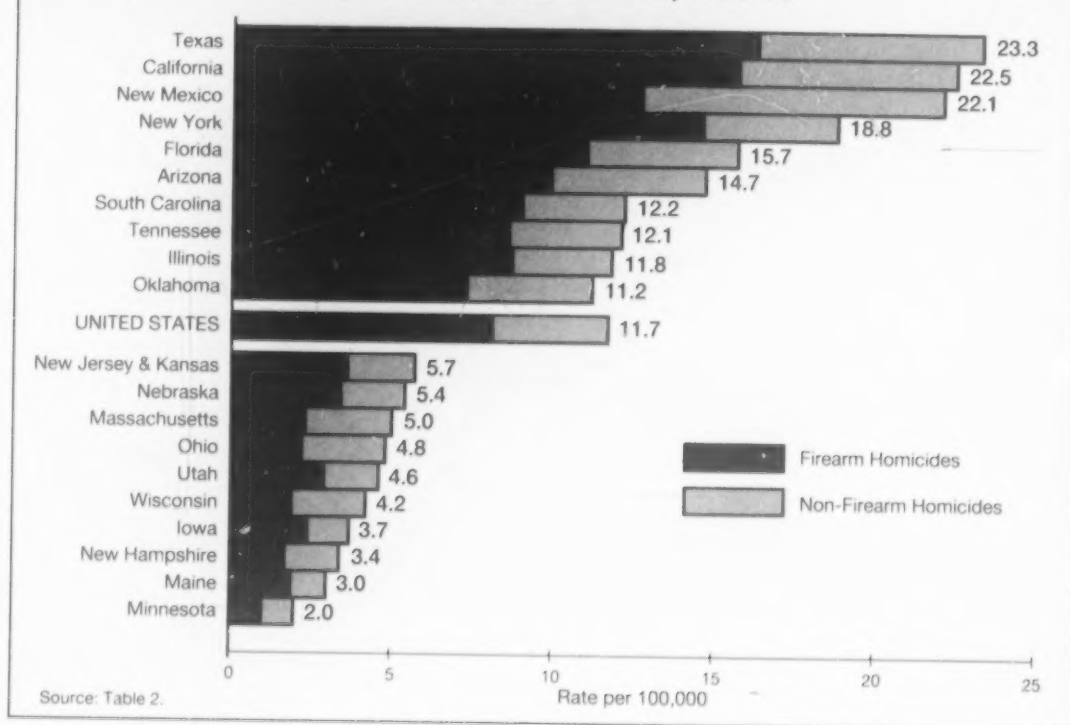
State	Rate Per 100,000				Number			
	Firearm		Non-Firearm		Firearm		Non-Firearm	
	White*	Black†	White*	Black†	White*	Black†	White*	Black†
United States	8.1	72.0	3.6	16.8	3,803	5,848	1,723	1,370
New England								
Maine	1.9	—	1.1	—	5	—	3	—
New Hampshire	1.7	—	1.7	—	4	—	4	—
Massachusetts	2.3	59.1	2.7	35.0	29	49	35	29
Rhode Island	3.3	—	2.8	—	7	—	6	—
Connecticut	5.7	48.8	2.7	19.0	36	36	17	14
Middle Atlantic								
New York	14.6	112.9	4.2	26.1	464	830	134	192
New Jersey	3.0	38.6	2.7	18.9	39	110	35	54
Pennsylvania	3.6	48.3	2.4	27.0	86	145	58	81
East North Central								
Ohio	2.2	31.6	2.6	17.1	49	94	56	51
Indiana	5.2	55.9	1.9	9.6	61	64	23	11
Illinois	8.7	79.9	3.1	23.5	191	402	67	118
Michigan	4.9	180.7	2.6	28.8	90	596	47	95
Wisconsin	1.9	48.5	2.3	19.4	21	30	25	12
West North Central								
Minnesota	1.0	—	1.0	—	10	—	10	—
Iowa	2.4	—	1.3	—	15	—	8	—
Missouri	4.4	106.5	3.0	18.8	44	159	30	28
Nebraska	3.4	—	2.0	—	12	—	7	—
Kansas	3.6	35.4	2.1	8.3	19	17	11	4
South Atlantic								
Delaware	—	13.3	—	10.0	—	4	—	3
Maryland	4.8	85.6	2.2	12.9	35	253	16	38
District of Columbia	—	136.9	—	31.4	—	148	—	34
Virginia	5.8	39.9	2.0	12.2	66	124	23	38
West Virginia	6.1	—	4.1	—	25	—	17	—
North Carolina	7.2	26.5	3.0	8.0	84	109	35	33
South Carolina	9.0	23.6	3.2	9.6	53	69	19	28
Georgia	6.2	50.3	3.7	14.1	66	229	39	64
Florida	11.0	111.4	4.7	16.5	224	479	95	71
East South Central								
Kentucky	6.8	26.7	2.8	4.6	56	23	23	4
Tennessee	8.6	71.4	3.5	14.3	80	155	33	31
Alabama	8.2	43.8	1.3	8.5	56	124	9	24
Mississippi	8.4	24.5	2.4	13.2	32	67	9	36
West South Central								
Arkansas	5.8	44.6	2.4	19.8	24	45	10	20
Louisiana	7.1	67.0	1.5	10.6	54	260	11	41
Oklahoma	7.3	31.1	3.9	12.7	47	22	25	9
Texas	16.3	60.3	7.0	15.0	582	346	250	86
Mountain								
Idaho	5.2	—	2.4	—	11	—	5	—
Colorado	6.9	31.7	3.8	5.3	52	12	29	2
New Mexico	12.7	—	9.4	—	10	—	28	—
Arizona	9.9	49.2	4.8	15.4	70	16	34	5
Utah	2.9	—	1.7	—	12	—	7	—
Nevada	4.8	—	2.9	—	10	—	6	—
Pacific								
Washington	5.5	37.8	3.2	11.1	52	17	30	5
Oregon	4.8	—	1.6	—	26	—	9	—
California	15.7	130.8	6.8	17.5	894	814	385	109

* Includes only those states with 65,000 or more white males 15-24 in 1988.

† Includes only those states with 10,000 or more black males 15-24 in 1988.

Source of basic data: National Center for Health Statistics, Division of Analysis, Office of Analysis and Epidemiology.

Figure C—States With 10 Highest and 10 Lowest Homicide Rates, White Males Aged 15-24, United States, 1986-88

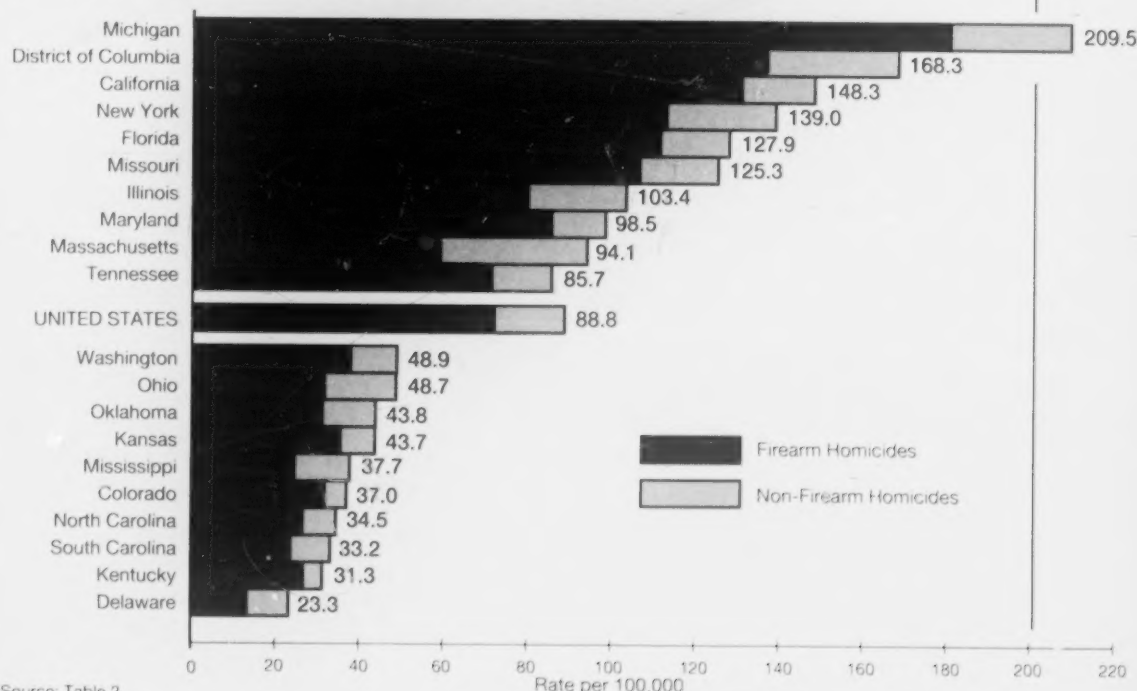


health successes. Not only have morbidity and mortality rates from many infectious diseases improved substantially, but impressive advances have also been made in chronic disease prevention, treatment and survival. Similar successes, however, are yet to be realized in relation to unintentional and/or intentional violent forms of premature death—deaths from firearms among children, adolescents and young adults. The problem is urgent and requires the coordinated efforts of criminal justice authorities, public health officials, social scientists and social welfare agencies.

Whatever the causes for the disturbingly high U.S. firearm and homicide fatality rates—poverty, unemployment, homelessness, social isolation, family disintegration, feelings of despair, etc.—

the results have devastating economic and social consequences. As a nation, if we hope to approach the year 2000 goals for homicide and violence reduction, we must act immediately. Not only should increased educational efforts be encouraged and more data collected, but issues of gun control, gun manufacturing and gun regulations should receive additional public as well as private debate and support. Resolution of these problems is essential and the time is now to act in an effort to help bring about the necessary reduction in U.S. firearm mortality rates across all ages and races. Our efforts must increasingly be more focused and directed at preventing the violence that results in the premature death among our youth, particularly among the young in minority groups. □

Figure D— States With 10 Highest and 10 Lowest Homicide Rates, Black Males Aged 15-24, United States, 1986-88



Source: Table 2.

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Violent Deaths in the United States: A Need to Know More

The rate of homicide among young American males, and particularly among young American black males, differentiates the United States from the rest of the industrialized world. In a comparison with 21 other developed countries, the U.S. homicide rate among males 15-24 years of age was found to be 4 to 70 times the rates in those countries.¹ The proportion of homicides that were committed with firearms further separates the United States from the rest of the industrialized world; three-quarters of the U.S. homicides among males 15-24 years of age involved the use of a firearm, compared with less than one-quarter in the comparison countries.¹

Trends

While U.S. homicide rates historically have been higher than those in the rest of the developed world, trends in homicide rates among young males in the United States have not been consistently increasing. For example, among black males 15-24 years of age, the homicide rate was higher in 1971 than in 1988 (108.2 vs 101.8 per 100,000). From 1971 to 1978 the homicide rate decreased 35 percent to 70.7 per 100,000 followed by a brief (2-year), but significant, increase (19 percent) and then another big decline of 27 percent to 61.5 per 100,000 in 1984. The injury prevention field would greatly benefit from an in-depth understanding of the factors that influenced those declines in homicide.

Firearm deaths also result from suicides and unintentional injuries. Firearm suicide rates, particularly among white and black male teenagers and black males 20-24 years of age, increased from 1984 to 1988 without similar increases in nonfirearm suicide rates.² Death rates from unintentional firearm injuries remain relatively low across all age-race-sex groups of young persons.

Prevention Strategies

Efforts to reduce firearm death rates will require different approaches depending upon whether the death was intentional or unintentional. Thus, it is not only important to provide the

data on all firearm deaths but to categorize firearm mortality by the manner of death—homicide, suicide or unintentional injury.

Prevention programs also require "small area" data. Information on the number of deaths as well as the population at risk is needed at the community level (the smallest unit that can be defined). This is crucial for targeting programs aimed at the prevention of firearm mortality.

Mortality data are not, however, sufficient for prevention efforts. Nonfatal firearm injury data are urgently needed. It has been estimated that there are at least seven nonfatal firearm injuries for every fatal one.³ At the present time, only five states are required to include external causes of injury codes (E-Codes) in their hospital discharge data sets. However, efforts are currently underway to require all states to include E-Codes in their hospital discharge data sets. Similarly, the National Uniform Billing Committee is currently considering revising the current Uniform Bill (UB-82) to include a new data element for E-Codes in the UB-92. It is essential to know the cause of the injury in order to establish successful prevention programs. □

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Impact of Fraudulent Claims on Health Care Costs

RECAP

Fraudulent Claims

The U.S. health care system, considered one of the best in the world for technological sophistication and availability of services, is being seriously threatened by continually escalating costs. Although there are many reasons for this, fraud within the industry accounts for 10 percent of the nation's annual health care bill. By the end of the decade, the fraud factor may cost the industry \$160 billion a year. Health insurers and state and government agencies are joining forces to share information and intensify their efforts in the battle against fraud. MetLife's in-house efforts include a specialized unit devoted entirely to the prevention, detection and prosecution of fraud. In 1990 the company's vigilance saved its policyholders over \$38 million. □

What is Health Care Fraud?

Richard Ekfelt, executive director of the National Health Care Anti-Fraud

Association, defines criminal fraud within the industry as "misrepresentation or omission of material facts with the intent to defraud." Additionally, health care abuse can be considered as charges that are above reasonable and customary fees, as well as treatment that is not medically necessary for the illness or injury, is excessive in duration or frequency, is beyond the scope of the provider, or is for unnecessary "maintenance" or "prevention."

Health care fraud can be as petty as changing the zero to an eight on a \$10 pharmacy bill or as sophisticated as large-scale professional operations misrepresenting millions of dollars' worth of services. It can be as simple as the forgiveness of insurance deductibles and co-payments, with the intention of recovering them by inflating fees, to as blatantly criminal and immoral as the performance of totally unnecessary services that endanger the patient's welfare for the sole purpose of monetary gain. Aptly put by the late U.S. Representative Claude Pepper, "Health care fraud takes its toll in more than just dollars. It also has an injurious effect on people. It entails people getting eye operations they don't need and then going blind. It entails people getting medical degrees from bogus medical schools in the Caribbean and then maiming or killing a patient. Health care fraud can hurt people. It can kill them."

What is Being Done About It? At the National Level.

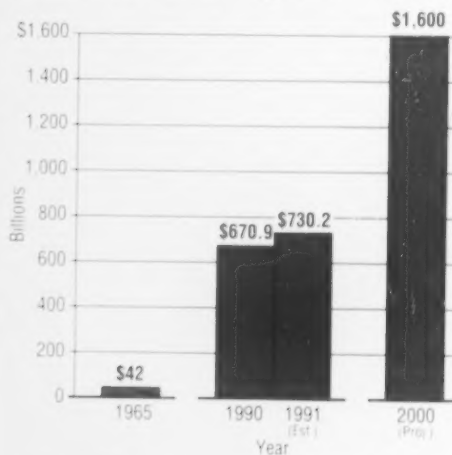
In recent years, insurers and state and government agencies have greatly

increased their fraud prevention and detection efforts. In 1985 a number of insurers united to form the National Health Care Anti-Fraud Association (NHCAA), whose mission statement is "to improve the prevention, detection and civil and criminal prosecution of fraud." One of the organization's main goals is to "provide an information-sharing network, with appropriate safeguards, to aid in the investigation of health care fraud." Following the old maxim that there is strength in numbers, the NHCAA pools information about particular health providers for the purpose of making a case for investigation and prosecution by law enforcement authorities. The following are some of the major projects

the organization hopes to complete within the next five years:

- Develop an automated system to analyze provider payment information from each corporate member firm.
- Review and recommend statutory language to support anti-fraud regulation and legislation.
- Work in liaison with other industry organizations to prepare model state anti-fraud legislation.
- Commission a nationwide study in order to obtain better statistics about the extent of health care fraud and its effect on the industry and on the national economy.

Figure A—National Health Care Expenditures, United States 1965-1991 and Projection to 2000



Source: U.S. Health Care Financing Administration, Division of National Cost Estimates.

The Context of Fraud

Runaway health care costs and their impact on business and the economy are beginning to make front page news and are sparking political debates in the nation's capital. As the costs of medical care and supplies continue to escalate, consumers, insurers and the nation's policymakers are forced to wonder where—and how—it will all end.

The last 25 years have seen an increase of \$629 billion in medical care spending, from about \$42 billion in 1965 to \$670.9 billion in 1990, when it amounted to 12.3 percent of the gross national product. Moreover, as Figure A indicates, medical care costs are expected to rise to \$730.2 billion in 1991 and may reach \$1.6 trillion by the end of the decade. Figure B shows that in 1990 the per employee cost of medical plans averaged \$3,161, a 21.6 percent increase over the 1989 cost of \$2,600, and 46.3 percent higher than the \$2,160 average in 1988.

If American corporations are to remain competitive with foreign companies—

Also on the national level, the Medicare-Medicaid Patient and Program Protection Act of 1987 aims to prevent physicians who lose their license in one state from practicing in another, by mandating that hospitals and state licensing boards report to a national clearinghouse any disciplinary action taken against physicians who commit claims fraud.

In addition, eight states now have laws concerning fraudulent claims and/or requiring that statements appear on claim forms. The states are Alaska, California, Delaware, Florida, Idaho, Nevada, New Jersey and New York. Two of the most common laws mandate that claim forms contain a warning

stating that fraud is a felony and that insurers report all fraudulent claims to their state insurance department within 60 days.

At MetLife

Although awareness of fraud potential has always played an important role in MetLife's claim processing operations, in the last few years the company has intensified and formalized its efforts and created a special unit, one of the first in the industry, whose sole function is the detection, prevention and prosecution of health care fraud.

Since its beginnings in 1983, our Fraud Unit, alone, has saved group customers over \$20 million, and has recovered, or

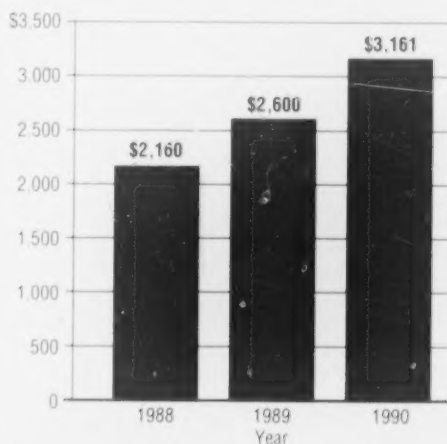
indeed, if the American health care system is to survive—it is clear that the trend of escalating costs must not continue.

Why the Upward Spiraling in Health Care Costs?

The contributing factors to the steady rise are many—from the steady increase in life expectancy to the catastrophic price tag of the AIDS epidemic, from the cost of malpractice insurance premiums to the cost of space age medical technology. The list seems endless.

The submission of fraudulent claims is an additional, and often overlooked, expense factor. The Federal Trade Commission and the Health Insurance Association of America estimate that fraud comprises 10 percent of the nation's health care bill. In 1989 this translated to \$60 billion, in 1990 to about \$67 billion, and by the end of the decade fraudulent charges may cost the nation over \$160 billion a year. □

Figure B—Average Health Care Cost per Employee, Public and Private Sector Employers United States, 1988 to 1990



STATISTICAL BULLETIN OCT. DEC. 1991

is in the process of recovering, an additional \$10 million including triple damage awards under the Racketeer Influenced and Corrupt Organization Act (RICO). Other review programs have also resulted in substantial savings.

We make a distinction between "saved" dollars and "recovered" dollars when dealing with fraudulent claims. "Saved" dollars represent money that would have been paid if an investigation had not uncovered fraud. "Recovered" dollars, on the other hand, is money

MetLife strongly believes in preventive fraud measures and controls, since it is difficult and expensive to recover large sums of money once they have been disbursed.

that was initially paid on a claim, but was later recovered after the fraud was uncovered. MetLife strongly believes in preventive fraud measures and controls, since it is difficult and expensive to recover large sums of money once they have been disbursed.

The company's fraud detection methods extend from the high sophistication of electronic technology to the very basic human "touch" of a trained claim processor's eye noticing an altered bill. The claim processing system has built-in intelligence to "flag" potentially fraudulent claims prior to processing. In addition, claim data is analyzed at the back end to uncover new and changing patterns. This includes listings of large payments,

third party payments where benefits are drawn to someone other than the covered person or the provider of service, an address match report where the provider's and the claimant's addresses are one and the same, and a report that identifies all providers who account for a significant percentage of the total health care expenses for a particular customer.

Other efforts are designed to arouse consumer awareness of the potential for fraud by encouraging benefit recipients, through a "stuffer" mailed with the explanation of benefits form (EOB), to call an 800 fraud hotline number to report any services or charges on the EOB that they do not recognize. To date, almost 40,000 calls have been received.

The company has also made use of posters distributed to many of its customers to be displayed in cafeterias, meeting rooms and other places often frequented by employees.

More insidious, perhaps, than the clearly fraudulent practices described, is the sophisticated and heretofore difficult to detect "coding fragmentation." The codes under which services are billed come from the very complex coding bible, the Fourth Edition of the AMA's Current Procedural Terminology (CPT-4). Creative use of these codes can inappropriately maximize a provider's income. While some coding fragmentation is done in error, much is clearly done with the conscious and sole intent of increasing the provider's income without increasing service to the patient. This type of aberrant billing practice is widespread and very often not even considered by the providers to be wrong. However, in its not uncommon worst form it is done with the blatant intent to defraud.

Code "unbundling" is a technique of listing multiple codes to misrepresent and/or overstate the amount of services actually provided. An example of this

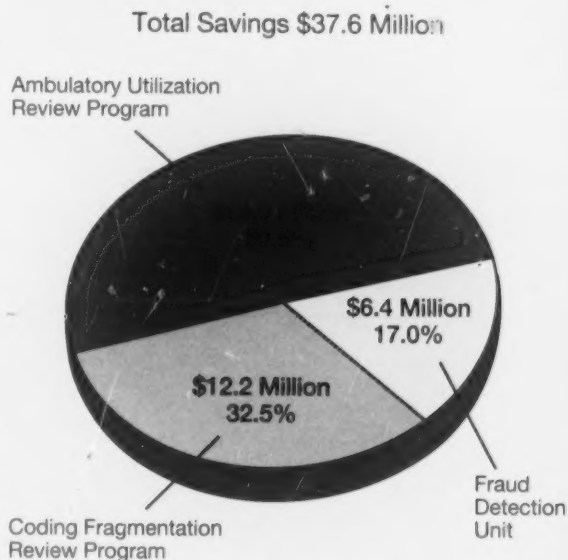
practice is a surgeon submitting a bill for a total hysterectomy, laparotomy and salpingectomy. According to the CPT-4 manual, the code for the total hysterectomy is inclusive of the other two, yet when the codes are broken out and billed separately, the resulting charge may be three times the reasonable charge for a hysterectomy.

Physicians found to consistently fail review criteria are flagged in the system, and all subsequent claims from them are subjected to review.

In an effort to detect this type of aberrant billing practice, MetLife has developed a Coding Fragmentation Review Program (CFRP). Claims are electronically identified by an expert system when these types of fragmented charges are submitted. They are then automatically "rebundled" and paid under the appropriate code. The program is currently applied to surgical charges and is soon to be expanded to laboratory codes and fragmentation of doctors' office visits.

Ambulatory Utilization ReviewSM (AUR) is another of MetLife's successful methods of fraud prevention. It is a natural outcome of our earlier focus on inpatient hospital activity. Our efforts to control inappropriate admissions and length of patient stay have encouraged a shift of abuse activity to the outpatient setting. In an effort to manage over-utilization in the outpatient setting, this

**Figure C—Distribution of Savings Identified From Fraudulent Practices by Type of Review Program
Metropolitan Life, 1990**



program has been built into our claim processing system. As claims are entered into the system, and the

MetLife efforts on behalf of its group customers have, in 1990, alone, saved about \$38 million.

frequency of the services exceed the criteria, the claim is referred to an on-site nurse. Of outpatient claims reviewed, approximately 4-7 percent are suspended, with the majority being subsequently

paid and approximately 1-2 percent recommended for denial.

Those physicians found to consistently fail review criteria are flagged in the system and all subsequent claims from them are subjected to review. AUR has been particularly effective in identifying and reviewing claims from physicians in specialties that are most likely to see patients frequently. The AUR program saved Metropolitan customers over \$19 million last year.

How Successful Has MetLife Been?

As Figure C presents, the company's efforts on behalf of its group customers, in 1990, alone, saved about \$38 million.

Major Cases Include:

- The conviction of the Shmushkevitch brothers—neither of them doctors—who masterminded a multi-million dollar insurance scam in California known to MetLife as the "Rolling Vans," consisting of trucks used to transport diagnostic equipment to various sites such as health spas and shopping centers. In return for claim forms and insurance ID numbers, the "Vans" offered free physical exams, including batteries of diagnostic procedures that were then billed to the insurance companies with fabricated diagnoses. To confuse and flood the system, the bills would be submitted under several different provider names, addresses and tax ID numbers.

The Shmushkevitches were eventually prosecuted by MetLife, Aetna and Employer's Mutual. MetLife, whose estimated payments were \$200,000 to \$300,000, was awarded more than \$8 million which included punitive damages and RICO implications. Although the brothers fled the country, they have recently been apprehended and the company

hopes to recover funds through the discovery process.*

- The filing of a fraudulent claim lawsuit against an allergist in New York State, for billing patients for some five thousand office evaluations that he did not perform. The allergist generally would see patients only for the first visit; thereafter, a nurse would administer the patients' injections. To help attract business, he waived the deductible and co-payment.

Although he did not personally see the patient, he charged \$40 for each visit, amassing approximately \$200,000 in claims just in office visit charges. During these "visits," no work was done other than the administration of an inoculation—for which he charged separately. He also charged separately for serum. The allergist settled out of court for \$350,000.

- The filing of a fraudulent claim lawsuit against two dentists in New York City charged with billing MetLife for services not provided, including comprehensive orthodontic treatment, bridges and crowns. They were also charged with performing unnecessary root canal surgery that destroyed patients' teeth, and inserting crowns on numerous healthy teeth of large numbers of patients. The dentists settled out of court for \$650,000.

Major Ongoing Projects Include:

- Careful monitoring of foreign claims, including those foreign providers who utilize U.S. billing addresses. Because of lax certification standards in some foreign countries, virtually any doctor or group of doctors can

*Discovery process refers to actions taken to uncover hidden assets.

set up "hospitals" and submit bills for insurance payment. Our continuing investigations of such facilities disclose that some simply do not exist, others lack sanitary bed and kitchen facilities yet bill for inpatient services, and some cannot produce any medical records for the patients involved. All such claims are denied.

- Close review of all "additional charges" or "corrective billings" that have been generated by "revenue recovery firms" or "auditing firms." Such firms have mushroomed in recent years and they usually contract with service providers to audit closed accounts dating as far back as 1985 to identify undercharges or services not previously billed. They are compensated by a percentage of the money recovered, usually in the area of 50 percent. Contacts with the service providers and the covered person usually reveal that the patient is not liable for these "bills."
- Careful monitoring of all claims for TENS (Transcutaneous Electrical Nerve Stimulation) devices. Although the TENS was originally developed as a device to relieve pain, it is currently being used for a variety of problems, including anxiety, insomnia, depression, and drug and alcohol abuse, which generally do not qualify for TENS treatment benefits under our plans. The majority of these claims are denied.

In today's health care marketplace the detection and control of fraud can be difficult. Current fraud-related losses total about \$73 billion, an additional pressure making it increasingly difficult to hold costs down. Now, as never before, the health insurer is facing a double-edged

In today's health care marketplace the detection and control of fraud can be difficult.

sword. On the one hand, there are demands for increased productivity and quick payment of claims while, on the other hand, demands for quality and the danger of fraud make a slow and careful review of every bill essential. Fighting fraud is one of many steps toward controlling costs to which MetLife is committed. □

Sarah Kelly
Vice-President
Group Claims Operations
Metropolitan Life Insurance Company

Reporter's Notebook: AIDS Conference

A delegate from the Metropolitan Life Insurance Company attended the June 1991, International AIDS Conference in Florence, Italy. The editors of *SB* believe that these notes based on his observations will interest readers.

Through 1988 HIV had only a minor influence on U.S. life expectancy.

A study using 1988 mortality data showed that, if AIDS/HIV were eliminated as an underlying cause of death in the United States the estimated gain in life expectancy at birth would be small (0.19 years). Black men would gain the most (0.52 years) and white women would gain the least (0.02 years). Future estimates of the disease's life expectancy impact were not made.

"Backward" and "forward" methods agree.

Accuracy of the so-called "backward" calculation method for estimating HIV prevalence was tested in Los Angeles County. (It estimates the number of HIV+ persons from the total AIDS cases in an area—Ed.) A study in L.A. County compared the HIV+ prevalence estimated from hospital data ("forward" method) with the estimated prevalence based on AIDS cases ("backward" method). Happily (from a statistical perspective), they yielded similar results: 42,500 infected persons (hospital HIV+ data) and 37,200 persons ("backward" method).

U.S. Army highest risk persons: young blacks.

The U.S. Army regularly monitors HIV infection rates in enlisted men and women. The average annual new case rate for HIV infection was reported to be 0.35 per 1,000 persons. It was highest and increasing in the Army's black teen-agers, but remained unchanged in whites of that age group, in women in general, and in men over age 35 years.

Increased rate of transmission in third world countries.

According to the World Health Organization, between 1991 and the year 2000 the total HIV+ population world-wide will rise from 10 million to 40 million. Though 40 million will be a small proportion of the world's year 2000 population of 5.2 billion, the socioeconomic impact in many developing countries is expected to be sizable.

Asia will experience a dramatic increase in HIV-disease by the year 2000.

The number of cases are expected to rise from less than one million infected persons (1991) to 10 million. Projections for annual AIDS cases range from 500,000 to 750,000. Already, Thailand and India are reporting rapid increases in the number of HIV-infected persons. Thailand, which three years ago had 50 HIV-infected persons, now estimates over 200,000; a survey of 1,500 persons repeated eight months later in the Indian state of Manipur found 54 infected while only a single infected person was found the first time.

Bisexual men: new estimate of their relative population size.

Nearly 30 percent of men-who-have-sex-with-men in one study were bisexual. Because this group is increasingly suspected to be a major factor in the heterosexual transmission of HIV, identifying them has important preventive implications. Bisexuality was reported to be more prevalent in black and hispanic men than in whites.

Bisexual men: often their sex behavior is unknown to heterosexual partners.

Most bisexual men were involved in stable heterosexual relationships and

were very secretive about their bisexuality; only 20 percent in one study had revealed their bisexuality to their heterosexual partners.

Prevalence of heterosexual anal intercourse.

This sexual behavior is more common than generally thought. In a review of 38 published studies with more than 160,000 women who had gonorrhea, nearly 40 percent had the rectal involvement, indicating anal intercourse. This is a concern because it has greater risk for HIV transmission than vaginal intercourse.

Rising HIV-infections in poor, women ages 17-19 years.

These uneducated young women's HIV seroprevalence rates are rising more rapidly than their male counterparts. In a 33-month national study (1988-1990), the rates in these young women rose a shocking 86 percent, from 2.2 to 4.1 per 1,000; whereas among poor, young men the rates fell 24 percent, from 3.8 to 2.9 per 1,000.

Total estimated charges for HIV-disease care in the United States in 1990 were \$5.3 billion.

The good news was that those dollars were only 0.75 percent of that year's total health care expenditures. The bad news is that by 1994 those charges will be \$10 billion. In 1990 the AIDS cases represented 61 percent of all charges due to HIV-infections, the other 39 percent was attributable to care given HIV-infected persons who had not yet developed AIDS ("nonAIDS"). Total 1990 charges (AIDS and nonAIDS) were: hospital, \$2.67 billion; ambulatory, \$2.25 billion. Within those charges, nonAIDS care was: hospital, \$1.91 billion; ambulatory, \$1.17 billion. □

1990 Census Results

RECAP

1990 Census Results

The April 1990 Census found that, for the most part, the major demographic trends of the 1970s continued into the 1980s. The population gain in California, Texas and Florida accounted for more than half of the national increase in the past decade. The rapid growth of these states was mainly attributed to the large influx of persons of Hispanic origin, as well as Asians and Pacific Islanders to California. The government acknowledged that there was an undercount but, nevertheless, decided not to adjust the original April 1990 Census numbers. □

The April 1, 1990 Census count of the resident population of the United States will stand at 248,709,873. This was the decision announced on July 15, 1991, by

Commerce Secretary Robert Mosbacher. Mr. Mosbacher overruled the recommendation by the Bureau of the Census's director and its undercount steering committee to adjust the enumeration upward. The Bureau's post-enumeration survey, as well as its demographic review of state, local and federal records, indicated that the 1990 Census may have missed as many as 5.3 million persons (see page 22).

For the country as a whole, the recent census found that the resident population increased by 22.2 million between 1980 and 1990. This numerical growth represents a rise of 9.8 percent or the smallest gain since the 7.3 percent growth rate of the depressed 1930s. A breakdown of the population increase during the 1980s reveals that there were almost 37.5 million registered births and 20.6 million deaths, or a natural increase (births-deaths) of over 16.8 million persons. By comparison, during the previous decade 33.3 million births and 19.3 million deaths were recorded (natural increase 14.0 million). These figures indicate that net immigration (population increase less natural increase), which impacts some states significantly more than others, fell sharply—from 9.2 million during the 1970s to just 5.3 million during the 1980s. [Ed. note: A 1990 undercount revision would have raised the total number of immigrants to at least 10 million.]

Sharp Geographic Differences Found

Not surprisingly, the decennial rates of population growth exhibited sharp geographic differences. For instance, as Table 1 shows, the number of persons living

Rejected 1990 Census Revision

Geographic Area	Census Revision		Percent Change 1980-90
	Number	% Gain	
United States	253,978,000	2.1	12.1
New England	13,278,000	0.5	7.5
Maine	1,240,000	1.0	10.3
New Hampshire	1,116,000	0.6	21.2
Vermont	571,000	1.5	11.6
Massachusetts	6,039,000	0.4	5.3
Rhode Island	1,006,000	0.3	6.2
Connecticut	3,306,000	0.6	6.4
Middle Atlantic	38,097,000	1.3	3.6
New York	18,304,000	1.7	4.2
New Jersey	7,836,000	1.4	6.4
Pennsylvania	11,957,000	0.6	0.8
East North Central	42,439,000	1.0	1.8
Ohio	10,933,000	0.8	1.3
Indiana	5,586,000	0.8	1.7
Illinois	11,592,000	1.4	1.4
Michigan	9,404,000	1.2	1.5
Wisconsin	4,924,000	0.7	4.6
West North Central	17,866,000	1.2	4.0
Minnesota	4,419,000	1.0	8.4
Iowa	2,807,000	1.1	-3.7
Missouri	5,184,000	1.3	5.4
North Dakota	648,000	1.4	-0.7
South Dakota	707,000	1.6	2.3
Nebraska	1,595,000	1.1	1.6
Kansas	2,506,000	1.1	6.0
South Atlantic	44,706,000	2.6	21.0
Delaware	687,000	3.1	15.6
Maryland	4,869,000	1.8	15.5
District of Columbia	639,000	5.3	0.1
Virginia	6,353,000	2.7	18.8
West Virginia	1,842,000	2.7	-5.5
North Carolina	6,815,000	2.8	15.9
South Carolina	3,590,000	3.0	15.0
Georgia	6,633,000	2.4	21.4
Florida	13,278,000	2.6	36.2
East South Central	15,558,000	2.5	6.1
Kentucky	3,768,000	2.2	2.9
Tennessee	5,012,000	2.8	9.2
Alabama	4,146,000	2.6	6.5
Mississippi	2,632,000	2.3	4.4
West South Central	27,500,000	3.0	15.8
Arkansas	2,403,000	2.2	5.1
Louisiana	4,332,000	2.7	3.0
Oklahoma	3,214,000	2.2	6.2
Texas	17,551,000	3.3	23.3
Mountain	14,064,000	3.0	23.7
Montana	822,000	2.9	4.5
Idaho	1,035,000	2.8	9.6
Wyoming	466,000	2.7	-0.8
Colorado	3,376,000	2.5	16.8
New Mexico	1,586,000	4.7	21.7
Arizona	3,790,000	3.4	39.4
Utah	1,757,000	2.0	20.3
Nevada	1,232,000	2.5	53.9
Pacific	40,470,000	3.4	27.3
Washington	4,987,000	2.5	20.7
Oregon	2,898,000	2.0	10.1
California	30,988,000	3.8	30.5
Alaska	561,000	2.0	39.6
Hawaii	1,136,000	2.5	17.8

Source: Bureau of the Census Press Release CB91-221, June 13, 1991.

Rejected 1990 Census Revision

On July 15 Commerce Secretary Robert Mosbacher announced that the government would not adjust the 1990 Census for the undercounted population. Bureau of the Census studies indicated that 5.3 million persons, or 2.1 percent of the country's inhabitants may have been missed. Had his ruling gone the other way, possible revised state figures are presented. These numbers would have brought the April 1990 total resident population to 253,978,000, or a 12.1 percent decennial gain.

Briefly, the states that did well in the official census—California, Texas and Florida—would have been winners again. California and Arizona would have gained another Congressional seat, but at Pennsylvania and Wisconsin's expense.

Mr. Mosbacher said that, although a correction would improve the national count, "the paradox is that attempting to make the actual count more accurate by an adjustment, we might be making the shares (small areas) less accurate." □

in the Pacific and Mountain divisions, as a group, increased by over 20 percent. The relative gain was almost as large—18 percent—in the states comprising the South Atlantic division and was somewhat above the national average in the West South Central states—12 percent. On the other hand, comparatively small average increases—less than 4 percent—occurred in the East South Central, West North Central, Middle Atlantic and East North Central states. In the remaining geographic division—New England—the resident population increased by 7.0 percent between 1980 and 1990, or a higher relative rate of gain than in the prior decade. This area and Middle Atlantic and Pacific divisions were the only geographic groupings to experience larger relative increases during the 1980s than in the 1970s.

Although quite dissimilar, the growth rates in the two most populous states accelerated during the 1980s. In California, the resident population increased by 25.7 percent, or by 6.1 million people, bringing its April 1990 total to 29,760,021. On the other hand, the relative rise for the number of inhabitants in New York was only 2.5 percent, or to 17,990,455, but this increase reversed the decline that occurred during the 1970s. Nine other states experienced a larger percentage gain during the 1980s than during the previous decade. In addition to New Jersey, Minnesota and Alaska, three states—Massachusetts, Rhode Island and Connecticut—are in the New England area, which experienced good economic conditions in the decade. The remaining three—Delaware, Maryland and Virginia—are in the thriving South Atlantic division. Also in this division is Florida, with an April 1990 population of 12,937,926; the number of persons residing within its borders rose by 32.7 percent or by 3.2 million. The absolute gain was almost as large in Texas—the third largest state in the country—its population rose by 19.4 percent

to 16,986,510. If the population increases in Texas, Florida and California were to be totaled, this would account for more than half of the nationwide gain between 1980 and 1990. In the three remaining states with over 10 million inhabitants—Pennsylvania, Illinois and Ohio—the population was virtually the same as 10 years ago.

Four states—Nevada, Arizona, Alaska and New Hampshire—had notable growth in the decade. Nevada had the fastest

If the population increases in Texas, Florida and California were to be totaled, this would account for more than half of the nationwide gain between 1980 and 1990.

population growth during the 1980s, continuing its favorable relative position of the 1970s. Its resident population rose by more than 50 percent between 1980 and 1990 after having increased by almost two-thirds between 1970 and 1980. A neighboring state—Arizona—also experienced significant relative growth rates. Three times as populous as Nevada, Arizona's population increased by more than a third in the past 10 years, and in the prior decade the relative gain was more than 50 percent. Only two other states experienced population growth rates during the 1980s that were at least twice as large as the national average (see Figure). The number of persons in Alaska increased by almost two-fifths and the relative gain in New Hampshire was one-fifth.

Some states grew slowly and four actually lost population in the decade.

**Table 1—Resident Population of the United States
as of April 1, 1970-1990**

Geographic Area	Population			Change			
	1970	1980	1990	Number		Percent	
				1970-80	1980-90	1970-80	1980-90
United States	203,302,031	226,545,805	248,709,873	23,243,774	22,164,068	11.4	9.8
New England	11,847,245	12,348,493	13,206,943	501,248	858,450	4.2	7.0
Maine	993,722	1,124,660	1,227,928	130,938	103,268	13.2	9.2
New Hampshire	737,681	920,610	1,109,252	182,929	188,642	24.8	20.5
Vermont	444,732	511,456	562,758	66,724	51,302	15.0	10.0
Massachusetts	5,689,170	5,737,037	6,016,425	47,867	279,388	0.8	4.9
Rhode Island	949,723	947,154	1,003,464	-2,569	56,310	-0.3	5.9
Connecticut	3,032,217	3,107,576	3,287,116	75,359	179,540	2.5	5.8
Middle Atlantic	37,213,269	36,786,790	37,602,286	-426,479	815,496	-1.1	2.2
New York	18,241,391	17,558,072	17,990,455	-683,319	432,383	-3.7	2.5
New Jersey	7,171,112	7,364,823	7,730,188	193,711	365,365	2.7	5.0
Pennsylvania	11,800,766	11,863,895	11,881,643	63,129	17,748	0.5	0.1
East North Central	40,262,747	41,682,217	42,008,942	1,419,470	326,725	3.5	0.8
Ohio	10,657,423	10,797,630	10,847,115	140,207	49,485	1.3	0.5
Indiana	5,195,392	5,490,224	5,544,159	294,832	53,935	5.7	1.0
Illinois	11,110,285	11,426,518	11,430,602	316,233	4,084	2.8	0.0
Michigan	8,881,826	9,262,078	9,295,297	380,252	33,219	4.3	0.4
Wisconsin	4,417,821	4,705,767	4,891,769	287,946	186,002	6.5	4.0
West North Central	16,327,547	17,183,453	17,659,690	855,906	476,237	5.2	2.8
Minnesota	3,806,103	4,075,970	4,375,099	269,867	299,129	7.1	7.3
Iowa	2,825,368	2,913,808	2,776,755	88,440	-137,053	3.1	-4.7
Missouri	4,677,623	4,916,686	5,117,073	239,063	200,387	5.1	4.1
North Dakota	617,792	652,717	638,800	34,925	-13,917	5.7	-2.1
South Dakota	666,257	690,768	696,004	24,511	5,236	3.7	0.8
Nebraska	1,485,333	1,569,825	1,578,385	84,492	8,560	5.7	0.5
Kansas	2,249,071	2,363,679	2,477,574	114,608	113,895	5.1	4.8
South Atlantic	30,678,826	36,959,123	43,566,853	6,280,297	6,607,730	20.5	17.9
Delaware	548,104	594,338	666,168	46,234	71,830	8.4	12.1
Maryland	3,923,897	4,216,975	4,781,468	293,078	564,493	7.5	13.4
District of Columbia	756,668	638,333	606,900	-118,335	-31,433	-15.6	-4.9
Virginia	4,651,448	5,346,818	6,187,358	695,370	840,540	14.9	15.7
West Virginia	1,744,237	1,949,644	1,793,477	205,407	-156,167	11.8	-8.0
North Carolina	5,084,411	5,881,766	6,628,637	797,355	746,871	15.7	12.7
South Carolina	2,590,713	3,121,820	3,486,703	531,107	364,883	20.5	11.7
Georgia	4,587,930	5,463,105	6,478,216	875,175	1,015,111	19.1	18.6
Florida	6,791,418	9,746,324	12,937,926	2,954,906	3,191,602	43.5	32.7
East South Central	12,808,077	14,666,423	15,176,284	1,858,346	509,861	14.5	3.5
Kentucky	3,220,711	3,660,777	3,685,296	440,066	24,519	13.7	0.7
Tennessee	3,926,018	4,591,120	4,877,185	665,102	286,065	16.9	6.2
Alabama	3,444,354	3,893,888	4,040,587	449,534	146,699	13.1	3.8
Mississippi	2,216,994	2,520,638	2,573,216	303,644	52,578	13.7	2.1
West South Central	19,326,077	23,746,816	26,702,793	4,420,739	2,955,977	22.9	12.4
Arkansas	1,923,322	2,286,435	2,350,725	363,113	64,290	18.9	2.8
Louisiana	3,644,637	4,205,900	4,219,973	561,263	14,073	15.4	0.3
Oklahoma	2,559,463	3,025,290	3,145,585	465,827	120,295	18.2	4.0
Texas	11,196,655	14,229,191	16,986,510	3,030,536	2,757,319	27.1	19.4
Mountain	8,289,901	11,372,785	13,658,776	3,082,884	2,285,991	37.2	20.1
Montana	694,409	786,690	799,065	92,281	12,375	13.3	1.6
Idaho	713,015	943,935	1,006,749	230,920	62,814	32.4	6.7
Wyoming	332,416	469,557	453,588	137,141	-15,969	41.3	-3.4
Colorado	2,209,596	2,889,964	3,294,394	680,368	404,430	30.8	14.0
New Mexico	1,017,055	1,302,894	1,515,069	285,839	212,175	28.1	16.3
Arizona	1,775,399	2,718,215	3,665,228	942,816	947,013	53.1	34.8
Utah	1,059,273	1,461,037	1,722,850	401,764	261,813	37.9	17.9
Nevada	488,738	800,493	1,201,833	311,755	401,340	63.8	50.1
Pacific	26,548,342	31,799,705	39,127,306	5,251,363	7,327,601	19.8	23.0
Washington	3,413,244	4,132,156	4,866,692	718,912	734,536	21.1	17.8
Oregon	2,091,533	2,633,105	2,842,321	541,572	209,216	25.9	7.9
California	19,971,069	23,667,902	29,760,021	3,696,833	6,092,119	18.5	25.7
Alaska	302,583	401,851	550,043	99,268	148,192	32.8	36.9
Hawaii	769,913	964,691	1,108,229	194,778	143,538	25.3	14.9

Source: 1970 and 1980 figures from 1980 Census of Population PC80-1-A1, Table 8;
1990 from Bureau of the Census press release CB91-100.

[illegible]

population loss occurred in West Virginia, namely 8 percent, while the decline was 4.9 percent in the District of Columbia. [Ed. note: The population decrease in the District of Columbia would have been offset by an upward census revision.] In the energy producing state of Wyoming, the population decline of 3.4 percent in the past decade represents a sharp reversal from the 41 percent gain during the 1970s.

The ethnic composition of the United States continues to change dramatically as a result of relatively recent immigration patterns. Between April 1980 and 1990 the number of Asians or Pacific Islanders residing in the country virtually doubled—from 3.7 million to 7.3 million. Additionally, during this interval the

Table 2— Relative Distribution of Hispanic and Asian Population in Selected States United States, April 1, 1990 and 1980

State	1990				1980			
	Hispanic		Asian		Hispanic		Asian	
	Percent of U.S. Total	Percent of State Total	Percent of U.S. Total	Percent of State Total	Percent of U.S. Total	Percent of State Total	Percent of U.S. Total	Percent of State Total
United States	100.0	9.0	100.0	2.9	100.0	6.4	100.0	1.5
California	34.4	25.8	39.1	9.6	31.1	19.2	35.8	5.3
Texas	19.4	25.5	4.4	1.9	20.4	21.0	3.4	*
New York	9.9	12.3	9.5	3.9	11.4	9.5	8.9	1.8
Florida	7.0	12.2	2.1	1.2	5.9	8.8	1.6	*
Illinois	4.0	7.9	3.9	2.5	4.4	5.6	4.6	1.4
New Jersey	3.3	9.6	3.7	3.5	3.4	6.7	3.0	1.4
New Mexico	2.6	38.2	*	*	3.3	36.6	*	*
Hawaii	*	7.3	9.4	61.8	*	7.4	16.7	60.5

* Less than 1.0 percent.

Source: Bureau of the Census press release CB91-100, March 11, 1991.

number of persons of Hispanic origin increased from 14.6 million to 22.4 million or by 53 percent. Combined, the population

The destinations of the vast majority of newly arriving Hispanics and Asians tend to be the West and Southwest regions of the United States.

growth for these two racial groups accounted for over half of the national gain during the past decade. Moreover, they

currently constitute 12 percent of all persons living in the United States—up from 8 percent just 10 years ago.

The destinations of the vast majority of newly arriving Hispanics and Asians tend to be the West and Southwest regions of the United States. California, in particular, is attracting the bulk of these newcomers, and they are materially changing the ethnic diversity of its population. According to the official April 1990 Census figures, fully one-third of all persons of Hispanic origin and two-fifths of all Asians or Pacific Islanders reside in this state. As a result, 36 percent of California's population is currently composed of these two racial groups—26 percent Hispanics and 10 percent Asians. As can be ascertained from Table 2, in April 1980 just one-fourth of the

state's population was of Hispanic or Asian origin. Continuing to peruse the table reveals that Hispanics residing in Texas (mostly those of Mexican origin) constitute a significant portion of its population, as well as a large part of the entire racial group. For instance, Texas contains about 20 percent of all Hispanics living in the nation—the same relative number as in 1980. However, in 1990, they made up one-fourth of the state's population compared with one-fifth in 1980. Thus, of the country's more than 22 million—Hispanics—12 million, or 54 percent, reside in these two populous states.

Persons of Hispanic origin are an important part of the population of most of the Southwest states. A notable example is New Mexico, where almost two-fifths of the state's residents are from this racial group. In 1990 Hispanics represented 19 percent of Arizona's population, 13 percent of Colorado's and 10 percent of Nevada's. Other parts of the country are also experiencing substantial Hispanic growth. For instance, Hispanics (mainly of Cuban, Central and South American origin) constitute 12 percent of the population of Florida and 7 percent of all persons of Hispanic origin. In New York, the relative importance of Hispanics (in particular, Puerto Ricans) is also substantial. Persons of this racial group comprise 12 percent of the state's residents, as well as 10 percent of the U.S. Hispanic population. Illinois and New Jersey are other states that have been attracting persons of Hispanic origin in the past decade. In 1990 the previously mentioned ten states, as a group, are the place of residence of nearly 90 percent of the nation's total number of persons of Hispanic origin.

Although the number of Asian or Pacific Islanders has grown rapidly between 1980 and 1990, they are a significant portion of the population in only a few states. In fact, nearly three-fifths of all persons of this

ethnic background reside in just California, New York and Hawaii. In both New York and Hawaii the number of persons of Asian or Pacific Islander descent accounted for almost one-tenth of the national total.

Adjustment Uncertainty Exists

The official 1990 Census results and the magnitude of the apparent undercount have led to severe criticism from various agencies. Numerous lawsuits have already been filed seeking revisions, and it is likely that more are pending. Therefore, the

At stake are not just Congressional seats and redistricting of political boundaries within many states, but billions of dollars in federal aid.

values shown in the accompanying tables should be used with caution as some adjustment could be necessary. At stake are not just Congressional seats and redistricting of political boundaries within many states, but billions of dollars in federal aid. If forthcoming, any revision benefiting one state would come at the expense of another. □

Charges for Substance Abuse Hospitalization: Regional Variations, 1990

RECAP

Hospitalization Charges for Substance Abuse

MetLife 1990 group health insurance costs for a substance abuse hospitalization averaged \$7,660. The highest average total charges were reported in Texas and New Mexico, each with costs 30 percent or more above the U.S. average. The lowest average costs (those more than 30 percent below the norm) were reported in Oregon, Iowa, Minnesota and Massachusetts. Physician charges comprised less than 10 percent of the average total charges. Ancillary fees ranged from 6 percent of the hospital portion of the bill in Montana to 41 percent in Texas. □

During the 1980s there were dramatic increases in admissions and costs associated with inpatient treatment of mental disorders and substance abuse.¹ The estimated costs of mental illness and substance abuse in 1988 were 25 percent higher than in 1985. Between 1978 and 1988, admissions to the 726 nonfederal mental hospitals increased almost 19 percent with 87 percent of such hospital beds occupied in 1988.^{2,3} Because of the complexity and intricacy of the issues involved, containing such psychiatric costs may prove even more challenging than controlling medical and surgical expenditures.^{4,5}

It has been shown that among employers who could measure their mental health expenditures, there was an 18 percent increase in such costs between 1988 and 1989. Substantial differences were apparent by size of company, however, with costs increasing 47 percent among companies with 5,000 or more employees.⁶ The proportion of the medical plan that represents mental health and substance abuse costs also increased—up from 8.7 percent in 1988 to 10.8 percent in 1989.⁴

MetLife Study

Increased surveillance, plus more widespread and accurate measuring, can help lead to the formulation of cost containment plans for mental health and substance abuse problems. Toward the goal of better understanding some of these issues, Metropolitan Life Insurance Company statisticians studied the geographic distribution of costs associated with substance abuse hospitalizations during 1990. Based on claims paid by MetLife for group health insurance, Corporate Health Strategies, Inc., linked hospital and physician claims

**Table 1—Family Relationship of Insured Persons
Hospitalized for Substance Abuse
Metropolitan Life Insurance Company Group Health Claims, 1990**

Relationship	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Total	5,743	100.0	2,052	100.0	7,795	100.0
Self	3,805	66.3	881	42.9	4,686	60.1
Spouse	1,035	18.0	833	40.6	1,868	24.0
Child	903	15.7	338	16.5	1,241	15.9

Source: Claims data from Metropolitan Life Insurance Company, merged and edited by Corporate Health Strategies, Inc. Analyses and computations by Health and Safety Education Division, Metropolitan Life Insurance Company.

for DRG* Codes 433-438 during calendar year 1990. There were 7,823 admissions for these "substance use and substance induced organic mental disorders" among employees and dependents covered by MetLife group insurance during 1990. Such admissions were up 14 percent over 1989, with average costs increasing 5 percent despite no change in the average length of hospital stay. Average hospital and physician charges are presented by geographic area and state for all 1990 "typical" admissions of persons under age 65; the median age was 34. Presentation of charge data excludes 28 records for which geographic data were incomplete and is restricted to the 42 states with at least 20 admissions. These represent 99 percent of the cases.

The vast majority (74 percent) of the admissions were men, among whom almost two-thirds were employees directly covered by the group policyholder (Table 1). Among the women, similar proportions were either the insured or spouse of the insured. Dependents, i.e., spouse and/or child of the insured, accounted for two-fifths of the 1990 admissions for substance abuse. Alcohol was the substance involved in

more than two out of every three admissions. Among the 33 percent hospitalized because of drug abuse, cocaine was involved in 36 percent of the cases; cannabis accounted for 12 percent followed by opiates in 11 percent of the admissions (Figure A).

MetLife received nearly 7,800 claims for substance abuse hospitalizations during 1990 among its group policyholders.

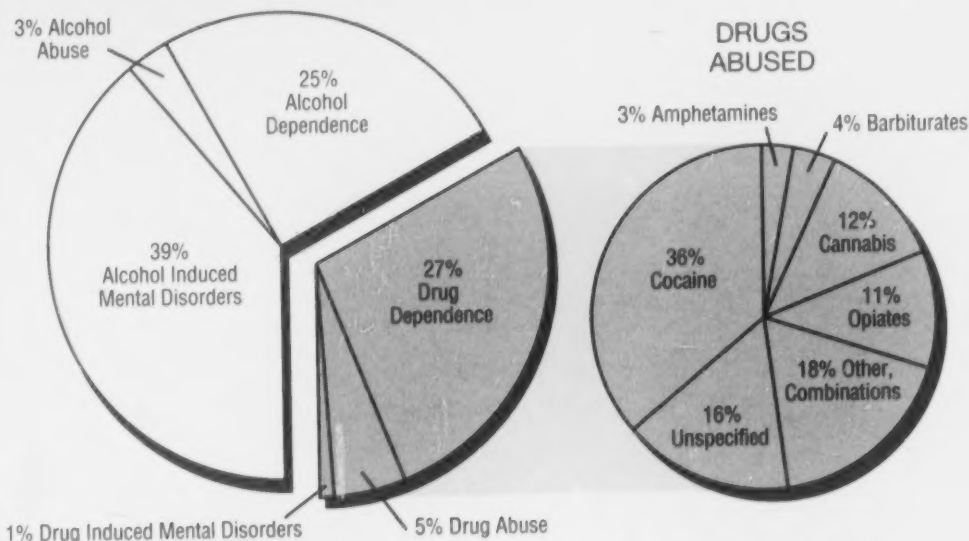
Average Total Cost Variations

In 1990 the average total hospital and physician charge to MetLife for substance abuse was \$7,660 with considerable geographic variation in costs (Table 2 and Figure B). Three of the nine divisions reported average total charges above the U.S. average. The highest average regional charge was in the West South Central area—\$9,930. This amount was primarily due to the charges in Texas, which were 33 percent above the U.S. average. The Pacific area had the second highest total charge. California contributed 83 percent of these

*DRG = Diagnosis Related Groups.

"Typical" admissions exclude length-of-stay outliers according to DRG criteria.

Figure A—Percent Distribution of Substance Abuse Hospitalization Diagnoses, 1990



Source: Data from Metropolitan Life Group Health Claims merged and edited by Corporate Health Strategies, Inc.

cases with an average total charge 16 percent above the norm. The two lowest regional charges were reported in the West and the East North Central states, 24 and 10 percent, respectively, below the average for the country.

Cost Variations by State

Average charges differed by as much as 147 percent between states. Texas reported the highest total charge (\$10,150) and Oregon the lowest (\$4,110). Other states with charges comparably high as that in Texas were New Mexico, Louisiana, Arizona, California and Vermont. In addition to Oregon's low charge, averages were between 44 and 32 percent below the U.S. in Iowa, Minnesota and Massachusetts.

Physician and Hospital Charges

Hospital costs contributed more than nine-tenths of the total insurance charges for substance abuse treatment (Table 2).

The highest average total charge was reported in Texas, \$10,150, 33 percent above the U.S. average.

The hospital proportion of the total ranged from a low of 84 percent in West Virginia to 99 percent of the bill in Vermont and Rhode

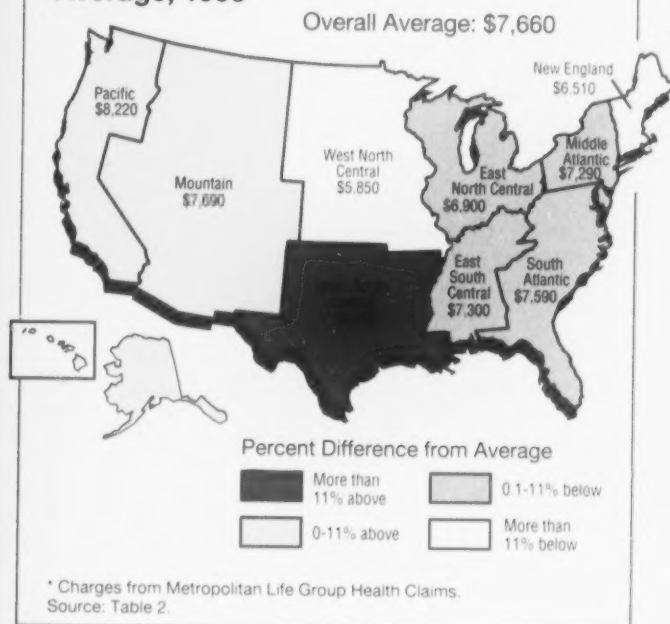
**Table 2—Substance Abuse Hospitalization Charges
Metropolitan Life Insurance Company Group Health Claims, 1990**

	Number of Cases	Average Charges (\$)					Average Length of Stay (Days)	Percentage	
		Total Hospital & Physician	Hospital Charge			Physician Charge		Hospital of Total	Ancillary of Hospital
			Total	Room & Board	Ancillary				
United States	7,795	7,660	7,080	5,500	1,580	580	16.7	92	22
New England	483	6,510	6,230	5,150	1,080	280	15.0	96	17
Maine	35	5,730	5,560	4,720	840	170	14.4	97	15
New Hampshire	124	8,230	7,950	6,940	1,010	280	19.9	97	13
Vermont	26	8,800	8,720	7,700	1,020	80	16.8	99	12
Massachusetts	86	5,220	4,760	3,450	1,310	460	10.5	91	27
Rhode Island	31	5,870	5,800	5,400	400	70	17.4	99	7
Connecticut	181	5,890	5,620	4,420	1,200	270	13.4	95	21
Middle Atlantic	821	7,290	6,920	6,040	880	370	15.9	95	13
New York	355	7,730	7,370	6,330	1,040	360	15.8	95	14
New Jersey	217	7,630	7,080	6,300	780	550	14.9	93	11
Pennsylvania	249	6,330	6,120	5,400	720	210	16.9	97	12
East North Central	1,533	6,900	6,470	5,330	1,140	430	16.0	94	18
Ohio	529	6,730	6,350	5,410	940	380	16.6	94	15
Indiana	174	7,150	6,740	5,510	1,230	410	16.3	94	18
Illinois	457	8,000	7,460	6,150	1,310	540	16.8	93	18
Michigan	142	5,800	5,550	4,070	1,480	250	14.9	96	27
Wisconsin	231	5,410	4,940	3,980	960	470	13.4	91	19
West North Central	476	5,850	5,460	4,450	1,010	390	16.0	93	18
Minnesota	160	4,780	4,470	3,800	670	310	16.1	94	15
Iowa	81	4,310	4,060	3,110	950	250	12.5	94	24
Missouri	144	7,610	7,050	5,670	1,380	560	17.2	93	20
Kansas	61	7,650	7,090	5,920	1,170	560	19.3	93	17
South Atlantic	1,645	7,590	6,920	5,550	1,370	670	15.9	91	20
Maryland	124	5,540	5,240	4,470	770	300	14.3	95	15
Virginia	208	8,090	7,500	6,280	1,220	590	17.7	93	16
West Virginia	36	7,760	6,490	4,590	1,900	1,270	14.3	84	29
North Carolina	190	6,430	5,970	4,880	1,090	460	17.8	93	18
South Carolina	125	7,600	7,350	6,100	1,250	250	17.0	97	17
Georgia	315	8,250	7,360	5,560	1,800	890	15.4	89	24
Florida	630	7,760	6,990	5,600	1,390	770	15.1	90	20
East South Central	535	7,306	6,720	5,390	1,330	580	16.9	92	20
Kentucky	127	7,510	6,870	5,780	1,090	640	15.9	91	16
Tennessee	245	7,090	6,510	5,180	1,330	580	18.0	92	20
Alabama	112	7,740	7,220	5,830	1,390	520	17.2	93	19
Mississippi	51	6,360	5,820	4,060	1,760	540	13.8	92	30
West South Central	1,210	9,930	8,950	5,530	3,420	980	17.0	90	38
Arkansas	42	6,620	6,170	4,490	1,680	450	14.0	93	27
Louisiana	181	9,850	9,010	6,410	2,600	840	18.5	91	29
Oklahoma	77	6,870	6,710	5,490	1,220	160	18.0	98	18
Texas	910	10,150	9,070	5,320	3,750	1,080	16.8	89	41
Mountain	356	7,690	7,150	5,680	1,470	540	16.7	93	21
Montana	23	5,820	5,610	5,290	320	210	22.8	96	6
Colorado	112	6,300	5,920	4,880	1,040	380	15.0	94	18
New Mexico	53	9,970	9,130	6,500	2,630	840	16.6	92	29
Arizona	71	9,080	8,280	6,480	1,800	800	17.6	91	22
Utah	38	7,920	7,450	5,560	1,890	470	15.0	94	25
Nevada	30	7,320	6,660	5,240	1,420	660	13.5	91	21
Pacific	736	8,220	7,570	5,920	1,650	650	16.1	92	22
Washington	90	5,710	5,560	4,200	1,360	150	17.9	97	24
Oregon	26	4,110	4,040	3,330	710	70	16.1	98	18
California	609	8,900	8,150	6,390	1,760	750	15.8	92	22

Note: Excludes states with fewer than 20 cases.

Source: Claims data from Metropolitan Life Insurance Company, merged and edited by Corporate Health Strategies, Inc.
Analyses and computations by Health and Safety Education Division, Metropolitan Life Insurance Company.

Figure B—Substance Abuse Hospitalization Charges* by Division and Percent Difference From Overall Average, 1990



Island. The hospital bill averaged \$7,080 for the country in general during 1990, with more than 75 percent attributed to room and board fees. While, nationwide, ancillary charges were responsible for less than a quarter of the average hospital charges, this proportion varied from as little as 6 percent in Montana to 41 percent in Texas. The Rhode Island ancillary services fees averaged \$400, almost one-fourth the average for the country, whereas the Texas fee (\$3,750) was 139 percent higher than the U.S. average.

Only 8 percent of the total charges to MetLife for substance abuse admissions was

attributed to the physician (psychiatrist) fees. While the U.S. average was \$580, these charges were 52 percent *lower* in the New England area and 69 percent *higher* in the West South Central states. The highest physician charges were recorded in West Virginia (\$1,270—119 percent higher than the average) and in Texas (\$1,080—86 percent higher). Psychiatrist charges were under \$100 in Vermont, Rhode Island and Oregon, where they were at least 86 percent lower than the U.S. average.

Length of Stay

Persons with a substance abuse problem remained in the hospital for an average of 16.7 days during 1990. This stay varied by as much as 6.2 days. Massachusetts confinement lasted only 10.5 days. Hospitalizations in Iowa, Connecticut, Wisconsin, Nevada and Mississippi were the next shortest, averaging 12.5 to 13.8 days. The state with the longest confinement was Montana, with almost 23 days of hospitalization. New Hampshire and Kansas, each reported relatively long confinements, 19.9 and 19.3 days, respectively.

Suggested Actions

Whatever accounts for the rising numbers of substance abuse hospitalizations, and the cost differentials associated with these admissions, there should be increased private and public awareness of the problem. Employers also need to evaluate the outcome effectiveness—outpatient compared with inpatient substance abuse treatment services. There is growing evidence of the efficacy of ambulatory treatment following brief hospitalization for detoxification. While a study of the geographic differences in substance abuse treatment patterns and the variation in their charges is also encouraged, the social and economic impact of substance abuse needs to be continually addressed at a national policy level. For taxpayers, insurance

companies with group health customers and American businesses in general, the increasing share of U.S. medical resources consumed by the problem of substance abuse and mental illness represents an important socioeconomic policy issue that needs prompt attention. □

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Background: Substance Abuse Hospitalization Costs

Health care spending accounted for more than 12 percent of the U.S. gross national product (GNP) in 1990. Such expenditures have increased approximately 10 percent each year since 1980, reaching an estimated \$671 billion in 1990. Given the nation's economic condition, the proliferation of new diagnostic and treatment modalities, and the aging of the population, experts project that the medical spending proportion of the GNP will top 13 percent in 1991.

These escalating health care costs are resulting in restructuring of the health benefits packages offered by many employers. Among the increasing variety of cost control measures are various managed care plans, hospital audits, outpatient utilization reviews, and the establishment of preferred provider

organizations (PPOs) as well as health maintenance organizations (HMOs). Companies that have instituted these or other measures are experiencing shifts in the spending of their health care dollars. The move is generally away from extensive medical/surgical inpatient care and towards more ambulatory surgery and shorter inpatient stays. Careful monitoring of these cost containment strategies and increasing treatment or claims-review protocols are becoming the norm as the government and the private sector look for ways to influence the spiraling health care costs.

Some progress in controlling health care costs is being evidenced by decreases in medical and surgical hospital utilization rates and general decreases in lengths of many hospital stays. □

Contents

VOL. 72

JAN-MAR

	Page
From the Editor's Desk	1
Trends in Medical Care Costs—Rapid Increases Continue	2
Breast Cancer Screening	12
American College of Radiology (ACR) Mammography Accreditation Program: Guidelines	17
Anti-Anxiety Drug Usage in the United States, 1989	18
Capsule Briefs	28
Death Data as Input to Policymaking	29
Commentary: Cause-of-Death Data in Older Persons: Importance to Policymakers	35
Statistical Information, Please	36
Historical Perspectives	Back Cover

APR-JUN

From the Editor's Desk	1
Approaches for Reducing Cancer Mortality in Minorities	2
Causes and Prevention of Cancer	6
The Epidemiology of Cancer in Black Americans	11
Making Cancer Prevention Effective for African-Americans	18
Cancer Prevention Initiatives in New York City	23
Panel and Audience Discussion	30
Statistical Information, Please	36
Historical Perspectives	Back Cover

JUL-SEP

From the Editor's Desk	1
Revising the Health Care System: Over 2,000 Opinion Leaders Speak Out	2
Tuberculosis Increases in the United States	10
Longevity Gains Continue	19
MetLife Employee Advisory Services (E.A.S.)	27
The Parent Report Card	33
Statistical Information, Please	36
Historical Perspectives	Back Cover

OCT-DEC

From the Editor's Desk	1
Firearm Mortality Among Persons Aged 1 to 34	2
Commentary: Violent Deaths in the United States: A Need to Know More	12
Impact of Fraudulent Claims on Health Care Costs	13
The Context of Fraud	14
Reporter's Notebook: AIDS Conference	20
1990 Census Results	21
Rejected 1990 Census Revision	22
Charges for Substance Abuse Hospitalization: Regional Variations, 1990	28
Background: Substance Abuse Hospitalization Costs	33
Contents and Index: 1991	34
Historical Perspectives	Back Cover

A

Anti-Anxiety Drug Use

market share of products, 1989	Jan-Mar	21
minor tranquilizer prescriptions, by diagnosis, United States, 1989	Jan-Mar	26
physician prescribing patterns, by specialty, United States, 1989	Jan-Mar	24
psychotherapeutic medications, components	Jan-Mar	19
regional variation in per capita new prescriptions for minor tranquilizers, 1989	Jan-Mar	22

Anxiety

drugs used for, United States, 1989	Jan-Mar	19
per capita use of drugs, by state, 1989	Jan-Mar	22

B

Breast Cancer

age-adjusted incidence rates, average annual, United States, 1983-87	Apr-Jun	14
age-adjusted incidence rates, by race/ethnicity, New York State, 1978-82	Apr-Jun	27
age-adjusted mortality rates, average annual, United States, 1983-87	Apr-Jun	14
age-adjusted mortality rates, by race/ethnicity, New York State, 1978-82	Apr-Jun	29
prevention recommendations	Apr-Jun	9
screening guidelines	Jan-Mar	14
screening projects	Jan-Mar	13
screening utilization, by race, 1987	Apr-Jun	17
survival rates by age at diagnosis, BCDDP project	Jan-Mar	13
survival rates by screening modality	Jan-Mar	15

C

Cancer

age-adjusted mortality rates, all sites, by race and sex, United States, 1973-1987	Apr-Jun	12
causes and prevention	Apr-Jun	6
community coalitions	Apr-Jun	31
declining rates	Apr-Jun	3
detection, importance of	Apr-Jun	4
dietary recommendations to help prevent	Apr-Jun	34
education of school children	Apr-Jun	34
effective prevention strategies	Apr-Jun	18
epidemiology, in black Americans	Apr-Jun	11
factors associated with increased risk	Apr-Jun	15
incidence rates, major sites, by race, United States, 1983-1987	Apr-Jun	14
intervention priorities	Apr-Jun	19
mortality from smoking	Apr-Jun	3
mortality rates, major sites, by race, United States, 1983-1987	Apr-Jun	14
prevention initiatives	Apr-Jun	23

Issue Page

Issue Page

prevention recommendations, 10 major sites	Apr-Jun	9
proposed prevention programs for minorities	Apr-Jun	5
public health progress	Apr-Jun	32
reducing incidence/mortality in minorities	Apr-Jun	2

Cause-of-Death Data

as input to policymaking	Jan-Mar	29
importance to policymakers	Jan-Mar	35
major uses	Jan-Mar	32
sources of statistics	Jan-Mar	31
vital statistics system	Jan-Mar	30
Cause-of-Death Data in Older Persons: Importance to Policymakers (Commentary)	Jan-Mar	35

**Census, United States,
1990**

rejected U.S. revision	Oct-Dec	21
	Oct-Dec	22

Charges (average), Substance Abuse

context of costs	Oct-Dec	33
regional variations in claims, 1990	Oct-Dec	31

Costs, Medical Care

changes in selected items, United States 1981-1991	Jan-Mar	9
health expenditures and per capita costs as percentage of GNP, 1960-1990	Jan-Mar	6
national health expenditures, United States, 1940-1990	Jan-Mar	4
personal health care total, United States, 1980 and 1985-1990	Jan-Mar	8
personal health expenditures by source of funds, United States, 1965 and 1988	Jan-Mar	10

D

Deaths

firearm, intentional, United States, 1986-88	Oct-Dec	9
firearm, geographic differences	Oct-Dec	8
firearm, prevention	Oct-Dec	12
firearm, rates, among ages 1-34, by race and sex, United States	Oct-Dec	4
firearm, trends in rates, males aged 15-34, by race, United States, 1979-1988	Oct-Dec	6

Diseases**See specific disease.****Drugs, Anti-Anxiety Prescriptions**

diagnoses, top 12 associated with minor tranquilizer use	Jan-Mar	26
minor tranquilizers product share, by state, 1989	Jan-Mar	22
trends in use, United States, 1960-1989	Jan-Mar	23

E

Employee Advisory Services

MetLife program description and effectiveness	Jul-Sep	27
--	---------	----

		Issue	Page			Issue	Page
	Expectation of Life						
	at selected ages, United States 1900-02 to 1989	Jul-Sep	23		mortality rates from firearms, by race and age, 1979-1988	Oct-Dec	4
	at single year of age, by race and sex, United States, 1988	Jul-Sep	24		Metropolitan Life Insurance Company		
	by sex and age, United States 1979-81 to 1990	Jul-Sep	20		conference, Cancer Prevention for Black Americans	Apr-Jun	1
	chances of survival, by race and sex, 1900-02 to 1989	Jul-Sep	23		Employee Advisory Services Program	Jul-Sep	27
	trends at birth, by sex, United States, 1970-1990	Jul-Sep	21		in-house efforts to detect and prevent fraudulent claims	Oct-Dec	15
	See also Survivorship.				Louis Harris Survey on health care reforms	Jul-Sep	2
F	Firearm Deaths			P	regional distribution and average charges for substance abuse hospitalizations	Oct-Dec	31
	rates among persons 1-34, by race, sex and age, United States, 1979-1988	Oct-Dec	4		Population, U.S.		
	regional distribution of homicides by race, firearm and non- firearm, United States, 1986-88	Oct-Dec	9		by state, 1970, 1980 and 1990	Oct-Dec	24
	trends among males, aged 15-34, by race, United States, 1979-88	Oct-Dec	6		distribution of Hispanics and Asians in selected states, U.S., 1990	Oct-Dec	26
	Violent Deaths in the United States: A Need to Know More (Commentary)	Oct-Dec	12		rejected U.S. revision by state, 1990	Oct-Dec	22
H	Health Care Fraud			S	Substance Abuse Hospitalizations		
	efforts, effectiveness, in preventing	Oct-Dec	13		average charges to MetLife group policyholders, 1990	Oct-Dec	31
	impact of fraudulent claims	Oct-Dec	14		regional distribution of average charges, 1990	Oct-Dec	32
	Health Care System				Survivorship		
	acceptance of financing reforms	Jul-Sep	8		chances of, from birth to specified ages, by sex and race, United States	Jul-Sep	23
	opinions of major stakeholders regarding possible reforms	Jul-Sep	7		See also Expectation of Life.		
	results of survey on how to reform	Jul-Sep	2	T	Tuberculosis		
	support for universal coverage	Jul-Sep	4		cases and case rates, by state, 1988-1990	Jul-Sep	13
	willingness to compromise	Jul-Sep	5		cases, by age and race, United States, 1989	Jul-Sep	11
	Hospitalization, Average Charges				rates and rankings in 5 highest U.S. cities with 100,000 to 250,000 people, 1987-1989	Jul-Sep	16
	regional distribution of average charges, substance abuse, 1990	Oct-Dec	31		rates in U.S. cities of 250,000 people or more, 10 highest and 10 lowest, 1989	Jul-Sep	14
	substance abuse, Metropolitan Life group policyholders, 1990	Oct-Dec	28		trends in morbidity and mortality, New York City, 1978-1990	Jul-Sep	17
L	Life Tables				trends in numbers and rates, United States, 1953-1990	Jul-Sep	12
	age, race, sex, United States, 1988	Jul-Sep	24	W	Women		
	Longevity				breast cancer, incidence and mortality rates, United States, 1983-87	Apr-Jun	13
	See also Expectation of Life.				breast cancer, screening projects	Jan-Mar	13
M	Mammography				breast cancer, survival rates by screening modalities	Jan-Mar	15
	guidelines for screening usage	Jan-Mar	14		expectation of life, by age, United States, 1988	Jul-Sep	24
	recommendations, by age	Jan-Mar	15		mammography screening guidelines	Jan-Mar	14
	survival rates by screening modalities	Jan-Mar	15		mortality rates from cancer, all sites, by race, United States, 1973-1987	Apr-Jun	12
	American College of Radiology Mammography Accreditation Program: Guidelines (Commentary)	Jan-Mar	17		mortality rates from firearms, by race and age, 1979-1988	Oct-Dec	4
	Men						
	expectation of life, by age, United States, 1988	Jul-Sep	24				
	firearm homicide rates, by race, and state, ages 15-24, United States, 1986-88	Oct-Dec	9				
	mortality rates from cancer, all sites, by race, United States, 1973-1987	Apr-Jun	12				

**Coming
in Future
Issues**

**Profile of Population—
With and Without Health Insurance Coverage**
Medical Care Costs: An Update
Causes of Mortality Among Children
Cesarean Section: Recent Trends

Correction

In the Jul-Sep 1991 issue, "Revising the Health Care System," Page 8, Table 2—"Major Stakeholders Acceptability of Selected Proposals," under the heading *Higher Taxes on Cigarettes and Liquor, Hospital CEOs*, column 8, should have read:

2 percent (*instead of 20 percent*) found the proposal "totally unacceptable."

Historical Perspectives

In 1988, the 10 leading causes of deaths in the United States accounted for four-fifths of the 2,167,999 deaths recorded throughout the nation.

The following table gives the gain in overall life expectancy if each of these 10

major causes of death were eliminated. As may be seen from the table, the greatest enhancement would be achieved with the complete elimination of mortality from diseases of heart followed by cancer. □

Gain in Expectation of Life at Birth (in Years) By Eliminating Specified Major Causes of Death, Total Population United States 1969-71 and 1979-81

Rank Order*	1969-71	1979-81
1. Diseases of heart	5.86	5.79
2. Cancer, all forms	2.47	3.00
3. Cerebrovascular disease (Stroke)	1.19	0.91
4. Accidents and adverse effects	†	1.14
Motor vehicle	0.70	0.62
5. Chronic obstructive pulmonary diseases	†	0.32
6. Pneumonia and influenza	0.47	0.28
7. Diabetes mellitus	0.24	0.20
8. Suicide	0.26	0.28
9. Chronic liver disease and cirrhosis	0.28	0.26
10. Nephritis, nephrotic syndrome, & nephrosis	†	0.10

* Rank based on number of deaths (1988).

† Comparable data are not available for these causes.

Source: Reports from the National Center for Health Statistics.



STATISTICAL BULLETIN

VOL 73 NO 1

JAN-MAR 1992



2 Major Causes of Accident Mortality Among Children: United States, 1988.

Nowhere is the vulnerability of children so apparent as when the causes of their death are examined. Nearly half are accidental in nature and, therefore, potentially preventable. A closer look at these tragic deaths offers directions for future preventive programs to take.

12 Charges for a Cesarean Section: United States, 1990.

19 Developments in Medical Care Costs.

 **MetLife®**

Contents

Statistical Bulletin Vol. 73, No. 1, Jan-Mar 1992

- 1 From the Editor's Desk
- 2 Major Causes of Accident Mortality Among Children: United States, 1988
- 9 Commentary: A Preventable Risk
- 10 Capsule Briefs
- 12 Charges for a Cesarean Section: United States, 1990
- 19 Developments in Medical Care Costs
- 27 Statistical Information, Please
- Back Cover: Historical Perspectives

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From the Editor's Desk

Of the preventable conditions experienced by Americans each year, tobacco-related ailments are the most frustrating from a health policy perspective because of their impact—more than 400,000 deaths annually.

In this issue, Joseph V. Vincenzino of MetLife's Business Economics Department, analyzes recent developments in medical care costs in the United States. The tobacco-related illnesses represented in these national costs are gargantuan. For instance, *SB* estimated that for 1986 the direct expense of a single coronary bypass graft surgery was \$30,500. If only 20 percent of those quarter million annual surgeries were due to smoking, one can envision the sizable potential economic implications from a national smoke-free policy. Then one begins to calculate the additional treatment costs of the more than 110,000 lung cancers diagnosed each year.

The total cost of cancer care is a substantial part of medical care expense, with more than one million new cancer cases in the United States in 1990. Prominent scientists estimate that 60 percent of them were preventable through lifestyle changes. It is reliably estimated that tobacco use causes more than 30 percent of all new cancers annually (and 40 percent in men).

The tobacco-cancer burden falls heavier on minorities than on whites. For instance, compared with whites, in 1983-87 African-Americans had a 10 percent higher rate of new lung cancers annually, and mortality rates that were 30 percent higher.

Despite the passage of nearly 30 years since the 1964 Surgeon General's Report on Smoking,

an estimated 60 million Americans use tobacco products. Why do so many people continue to use tobacco when it is widely known to be unhealthy? The reasons remain unclear, although they include purely personal decisions and addiction to tobacco. However, tobacco's marketing messages are clearly more evident than their industry's required tobacco advertising warnings, or other smoke-free educational messages from the public health sector.

The tobacco companies' marketing programs are to be grudgingly admired for their comprehensive research that promotes tobacco use. The tobacco industry's continued financial success can be partly attributed to its skillful advertising efforts targeting women, youth and minorities. Not to be overlooked, of course, are their market research budgets which, we assume, dwarf the sums spent by federally-funded, tobacco-use researchers.

In this presidential-election-year's discussions, efforts to control the nation's continued medical care inflation should be prominent. In that spirit, *SB* offers five recommendations (see below) for our candidates and political parties to consider in their platforms to control health care costs, disease and suffering.

If the federal government were united in its commitment to support research and service programs to make the nation healthier, we would move toward greater health and reduced medical care costs. The public, however, must forcefully ask for such policies. If there were a federal commitment, the health consequences from smoking could be dramatically reduced.

On that hopeful note, I wish you good reading. □

Charles B. Arnold

Five Recommendations For 1992 Federal Action

1. Encourage increased federal spending on research and service to promote smoke-free lifestyles.
2. Encourage the Congressional Budget Office (CBO) to estimate the proportion of federal health dollars spent to treat preventable diseases in 1992 and annually.
3. Encourage elected officials to use the CBO data to organize Congressional hearings that seek new federal policies on research and service for tobacco-related diseases.
4. Encourage more research to devise effective tobacco-use prevention strategies for women, youth and minorities.
5. Encourage greater federal support for research to improve the effectiveness of education aimed at making the United States a smoke-free nation. □

Major Causes of Accident Mortality Among Children: United States, 1988

RECAP

Accident Mortality Among Children

Despite continuing decreases in accident mortality, accidents remain the fourth leading cause of death at all ages, combined, and the first among ages 1-44. The male dominance is most pronounced among 25-to-44-year-olds, where men account for 78 percent of the accidental deaths. Motor vehicles predominate among causes of accidental deaths at all ages, but account for an overwhelming 80 percent of these deaths among teenagers and young adults. Fires and drownings are the next most frequent forms of accidental deaths among ages 1-4 and 5-14. Prevention is the key. Decreases in childhood accidental deaths require strategies that coordinate the efforts of industry, government, medicine, social services and the public. □

More than 97,000 Americans lost their lives in accidents during 1988, the latest year for which final U.S. data are available. Of this total, close to 56 percent, or 53,859 accidental deaths, occurred among persons aged 1 to 44. Accidents continue to be the fourth leading cause of U.S. deaths for all ages combined, despite a general downward trend in the rates since the early part of the century. Provisional data from the National Safety Council (NSC) indicate an overall 55 percent drop in rates between 1912 and 1990.¹ While ranked No. 4 for all ages, accidental deaths disproportionately affect the young and are the leading cause of death among ages 1-4, 5-14, 15-24 and 25-44.

As seen in Figure A, accident mortality rates have fluctuated over the years. Indeed, during the last three decades the standardized rates per 100,000 population increased slightly during most of the 1960s but resumed decreasing in the '70s and '80s. Further, the most recent estimates from the NSC show an annual 3 percent decline in these rates in 1989 and 1990.¹ Despite these reductions, accidents remain the single most important cause of death among persons between the ages of 1 and 37 and are: (1) the leading cause of morbidity among younger Americans; (2) a major cause of disability in U.S. children and youth; (3) estimated to cost more than \$173 billion each year; and (4) responsible for more years of potential life lost than cancer or cardiovascular disease.¹⁻⁵ Thus, accidents remain a significant public health problem as well as a major challenge to preventive medicine professionals.

While the decreasing accident mortality rates are encouraging, it is clear that much remains to be accomplished in the area of accident prevention. The burden of accidents on children and youth is



David Johnson

STATISTICAL BULLETIN JAN-MAR 1992

particularly poignant because so often they are the innocent victims of inattentive adults and, thus, their deaths could have, and should have, been prevented.

Despite decreases in the overall rate of accidental deaths since 1912, accidents remain the fourth leading cause of death for all ages, combined, and the leading cause between ages 1 and 44.

Accident Mortality by Age and Sex

As seen in Table 1, accidents are responsible for close to half of all deaths in each of the three age groups between ages 5 and 24. Nearly half of all deaths among youth ages 5-9 and 15-24 are from accidents while only a slightly smaller

percentage (46 percent) is due to accidents among 10-14-year-olds. Almost 40 percent of deaths among children ages 1 to 4 is due to an accident.

Males predominate as accident mortality victims in all age groups, even the very young. Male babies account for 57 percent of the accidental deaths under one year of age, and males are 61 percent of accident victims ages 1 to 4. The male dominance is most apparent among young adults, but their proportion ranges from just over 50 percent at age 65+ to the 78 percent among 25-to-44-year-olds.

Accident Mortality by Type

As seen in Figure B, motor vehicles account for much the largest proportion of accidental deaths among children and youth. Almost three out of every five deaths among children ages 5 to 14 are due to a motor vehicle and 35 percent of fatalities among ages 1-4. Motor vehicles overwhelm all other principal forms of accidental

Fatal Crashes and Minimum Drinking Age Laws

Results of a recent National Highway Traffic Safety Administration study* indicate an inverse relationship between the minimum drinking age (MDA) and the number of fatal crashes of drivers in the affected age groups. The investigators evaluated the effects of two changes in the MDA laws in Virginia—the first change was made in 1983 and raised the MDA for consumption of beer from 18 to 19 years of age; the second raised it to 21, between 1985

and 1987. The first change resulted in an estimated 19 percent reduction in fatal automobile crashes involving drivers in affected age groups, and the second led to an 18 percent reduction in such involvements over the period 1985 to 1987. The legal age for wine and hard liquor consumption remained at 21 during these years. The estimated number of lives saved in Virginia between 1984 and 1990 was 153 among the affected age groups.

The National Highway Traffic Safety Administration also reports that all states, plus the District of Columbia, currently have MDAs of 21. It estimates that these laws saved over 1,000 lives in 1990 and more than 11,000 lives since 1982. □

* U.S. Department of Transportation, National Highway Traffic Safety Administration. *Research Notes: Analysis of the Effect of Minimum Drinking Age Laws in Virginia*. Washington, D.C. National Center for Statistics & Analysis, Research & Development, August 1991.

deaths among teenagers and young adults (ages 15-24), accounting for a devastating 80 percent of their accidental deaths.

Fires and drownings are the second and third most frequent cause of accident mortality among persons ages 1-24. Their involvement is particularly pronounced among the youngest ages, however. In 1988 fires and drownings, together, accounted for 44 percent of the accidental deaths among ages 1-4 and 22 percent among youngsters between 5 and 14 years of age. While still ranking as second and third among the causes of accidental

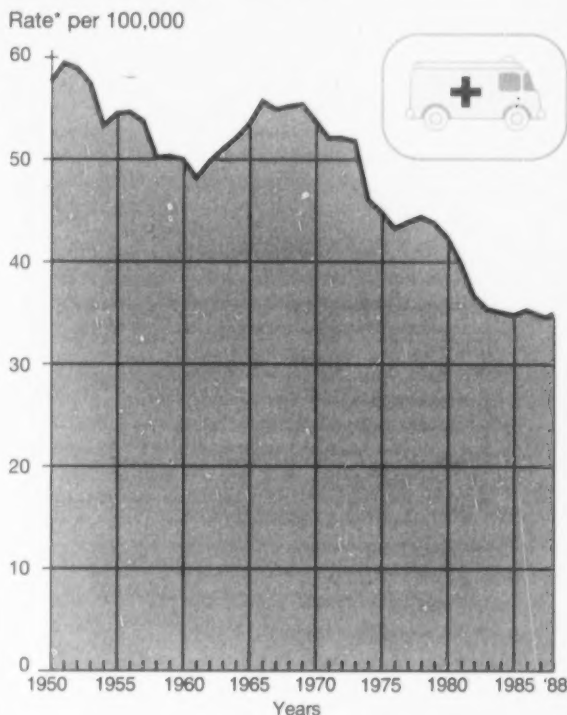
Nearly half of all deaths among ages 5-9 and 15-24 are from accidents.

mortality in young persons ages 15-24, fire and drowning contribute only 7 percent to the total accidental deaths in this age group.

Trends in Types of Accident Deaths and Gender Differences

Between 1978 and 1988 the accident mortality rates for 1-4-year-olds dropped 31 and 33 percent for boys and girls, respectively, while rates for 5-14-year-olds fell 32 and 24 percent, respectively. The decreases were steady among the boys but increased 9 percent in 1986 for the girls aged 1-4 and 6 percent in 1988 among girls aged 5-14 (Table 2). Table 2 also indicates an encouraging downward trend in motor vehicle deaths among boys ages 1-4 and 5-14. The rates have decreased more for the youngest group of boys (-37 percent since 1978) than for those ages 5-14, where the rate dropped 22 percent during the 11 years. While the rates for young girls ages 1-4 have dropped 31 percent since 1978, a

Figure A—Death Rates From All Forms of Accidents United States, 1950-1988



* Adjusted on basis of age distribution of the U.S. total population, 1940.
Source: Various reports from the National Center for Health Statistics.

disturbing 9 percent increase was reported in 1986 followed by a 5 percent increase in 1988. Among girls aged 5-14, the rate remained stable in 1986 but increased 6 percent in 1988.

For children and young adults, the very young are the most at risk for death from fires and burns. Mortality rates from this cause peak around age 3.¹ Among boys aged 1 to 4, the 1988 death rate from this accidental cause was four times higher than that for boys aged 5-14. The rate was one-and-one-half times that among little girls aged 1-4, with the sex differential all but disappearing among 5-14-year-olds

**Table 1—Total Deaths and Accidental Deaths
United States, 1988**

Age	All Deaths	Accidental Deaths	Percentage	
			Accidents of Total	Male Accidents of All Accidents
All Ages	2,167,999*	97,100*	4.5	67.8
Under 1	38,910	936	2.4	56.6
1-4	7,429	2,858	38.5	60.5
5-9	4,357	2,102	48.2	63.8
10-14	4,568	2,113	46.3	68.6
15-24	38,167	18,507	48.5	76.7
25-44	136,591	28,279	20.7	77.7
45-64	387,221	15,177	3.9	71.1
65+	1,550,169	26,996	1.7	50.7

* Includes deaths with age not stated.

Source: National Center for Health Statistics, Vital Statistics of United States, 1988, Vol. II, Part A.

(e.g., rates were 1.3 per 100,000 boys and 1.2 for girls). Between 1978 and 1988, there was an overall drop in the death rates from accidental fires for both sexes. While fluctuations occurred in each age group within the time period, the 1988 rate for boys aged 1-4 was 22 percent lower than the 1978 rate, and for the same aged girls,

Males predominate as accident mortality victims in all age groups even among the very young.

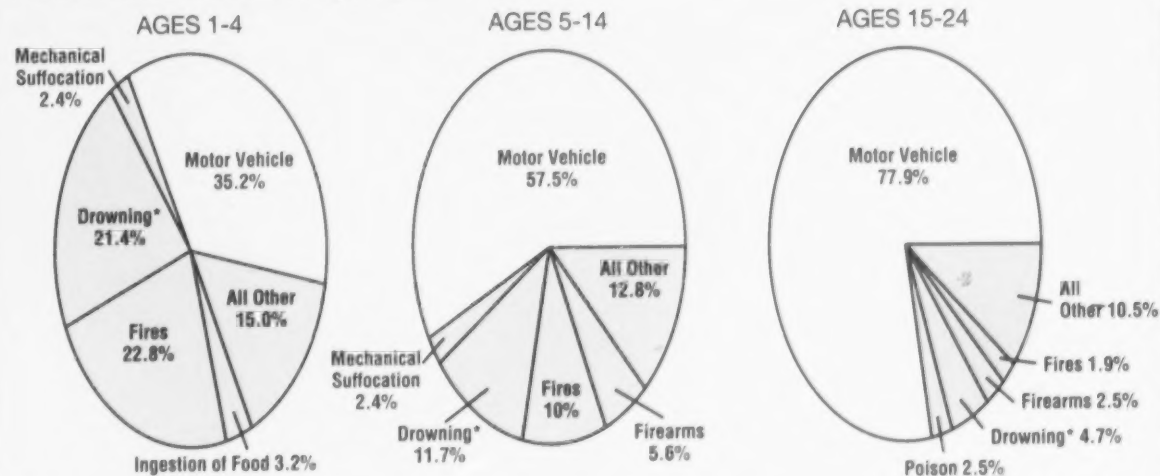
it was 33 percent lower. Deaths from fires dropped to third place among accidental causes for 5-14-year-olds of both sexes, accounting for a total of 420 deaths in 1988. Since 1978, the rates dropped 24 percent for boys and 25 percent for girls.

Not surprisingly, accidental drownings also affect younger children more than

older ones and boys more than girls. These accidents were the second leading cause of accidental deaths among boys ages 1-4 and 5-14 while they ranked third among girls in these age groups. In 1988, 417 boys and 194 girls ages 1-4 died by drowning. The drowning death rate for the boys of this age was twice that for similarly aged girls and 180 percent higher than that for boys aged 5-14. The rates have fluctuated since 1978 with an overall 19 percent decrease among boys aged 1-4 and a 16 percent decrease among the girls. Among boys aged 5-14, there were 361 drowning deaths versus 133 among girls. Between 1978 and 1988 the rates dropped 51 percent for 5-14-year-old boys and 27 percent for girls of this age.

The fourth and fifth ranked causes of accidental deaths in 1988 had rates ranging from a high of 1.1 per 100,000 for firearm deaths among boys aged 5-14 to a low of 0.1 for mechanical suffocation deaths among girls of this age. The rates fluctuated between the years with a general downward trend apparent since 1978.

**Figure B—Accident Mortality Among U.S. Children and Youth
Percent Distribution by Type, 1988**



* Exclusive of deaths in water transportation.

Source: National Center for Health Statistics, Vital Statistics of the United States, 1988, Vol. II, Part A.

Ingestion of food and/or objects resulting in suffocation or obstruction was the fourth leading cause among children aged 1 to 4 but was replaced by accidental firearm deaths among youngsters aged 5 to 14. Mechanical suffocation (smothering by bed clothes, plastic materials, etc., and/or strangulation by head entrapment or strings/cords on clothing or tags) was the fifth leading cause for boys and girls in both age groups. While there were 171 mechanical suffocation deaths among children aged 1-14 in 1988, firearms were responsible for 236 accidental deaths among 5-14-year-olds, alone (data not shown). Even among these latter two common causes of accidental deaths, boys continue to outnumber girls with the sex differential increasing with age.

Prevention is the Key

Nowhere is the vulnerability of children so apparent as when the causes of their death are examined. Nearly half the deaths among children and youth are accidental in nature and thus, are potentially

preventable. Of these deaths, motor vehicles account for the vast majority. It is encouraging that considerable progress has been made in the protection of children, particularly in automobiles. Speed limit legislation and regulation, improved vehicular child safety seat design, and

Fires, drowning, ingestion of food or objects and mechanical suffocation follow motor vehicles in the list of five leading causes of accident deaths among the young.

additional safety features in cars have all contributed to decreases in the rates of childhood deaths in motor vehicles. Nonetheless, the need exists for continued improvement. More attention should be paid to preventive programs that not only

**Table 2—Mortality From Five Leading Types of Accidents in Childhood
United States, 1978-1988**

	Death Rate per 100,000											
	Boys						Girls					
	1978	1980	1982	1984	1986	1988	1978	1980	1982	1984	1986	1988
1-4 Years												
All Accidents	33.6	30.5	26.4	23.9	23.7	23.1	23.8	21.0	18.4	15.5	16.9	15.9
Motor vehicle	11.6	10.2	8.7	8.0	7.8	7.3	9.4	8.1	7.2	5.7	6.2	6.5
Fires, burns	6.8	6.2	5.3	4.8	5.0	5.3	5.4	4.5	3.9	3.7	4.0	3.6
Drowning*	6.9	7.0	6.1	5.1	5.9	5.6	3.2	3.8	3.2	2.7	3.1	2.7
Ingestion of food, object	1.6	1.2	1.0	1.0	1.0	0.6	1.2	0.9	0.7	0.7	0.7	0.6
Mechanical suffocation	1.0	N/A	0.7	0.7	0.5	0.6	0.6	N/A	0.5	0.5	0.4	0.3
5-14 Years												
All Accidents	23.2	19.9	17.5	16.5	16.8	15.7	11.1	9.8	8.8	8.0	7.9	8.4
Motor vehicle	11.2	9.9	8.4	8.3	8.9	8.7	6.3	5.7	5.0	4.9	4.9	5.2
Drowning*	4.1	3.6	3.0	2.3	2.7	2.0	1.1	0.9	0.8	0.6	0.8	0.8
Fires, burns	1.7	1.4	1.5	1.6	1.5	1.3	1.6	1.4	1.3	1.1	1.1	1.2
Firearms	1.4	1.3	1.1	1.3	1.0	1.1	0.3	0.3	0.3	0.2	0.2	0.2
Mechanical suffocation	0.8	N/A	0.6	0.6	0.5	0.5	0.1	N/A	0.1	0.1	0.1	0.1

* Exclusive of deaths in water transportation.

Note: Rank based on total number of deaths in age category (1988).

Source: Various reports from the National Center for Health Statistics.

educate parents about child protection but also encourage the development and implementation of additional "strategies including technological innovations, legislative actions," etc.⁴

In addition, industry cooperation is needed to further reduce various hazards in the home, in the car, and during recreational activities. Additional standards regarding the flammability of materials such as furniture, bedding and other items, have been suggested and warrant attention. Further, the efficacy of smoke detectors has been proven, and their use and maintenance should continue to be encouraged. Helmet, seat belt and speed limit legislation needs additional policy attention.

Because the future of every country is its children, the current rate of their accidental mortality in the United States is a continuing source of concern. These deaths can be reduced, if not completely prevented, with the cooperation of industry, educational groups, public health officials and social service agencies. Despite the downward

trend in rates, additional programs are needed to help parents take preventive actions through enhanced public education. □

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A Preventable Risk

The National Highway Traffic Safety Administration (NHTSA) has estimated that in 1990 nearly 12,000 lives could have been saved if 85 percent of motor vehicle occupants involved in fatal crashes had used seat belts. Currently, the user rate is 54 percent in states with mandatory belt use laws. If all states had belt use laws, 5,800 more lives could have been saved in 1990, according to NHTSA estimates.

Three things will help to bring safer driving through the use of seat belts.

First, automatic seat belts are at hand. Beginning with the 1990 car models, all car manufacturers are required to equip their passenger vehicles with automatic ("passive restraint") crash protection. Some manufacturers provide airbag systems instead of belts. Safer driving should result. For instance, the National Highway Traffic Safety Administration estimated the belt usage for automatic belts at 79 percent in 1990. Why not 100 percent? Mainly because there is evidence that many automatic systems are being misused. Nine states do not have mandatory seat belt laws.

Second, there must be strong public support for vigorous law enforcement across the country.

Third, there must be constant research to improve the technology for passive crash protection systems, so that they can become more convenient and comfortable.

What Can Be Done

Everyone can help make a difference in the campaign to make auto crashes less harmful, by taking some simple personal and public actions.

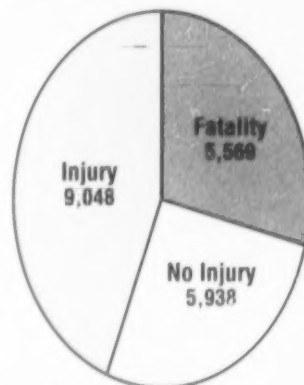
On the personal level, remember to always use a seat belt whenever you are either the driver or a passenger. Never carry a passenger who's not using a seat belt, or a child not in a safety seat or harness.

Public action is also urgently needed now, if we are to be safer when riding in cars. Here are a few simple public-spirited actions that can be taken to secure further seat belt use in your state:

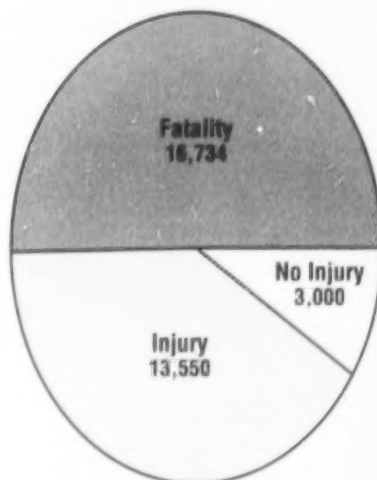
- Promote a mandatory seat belt use law, if your state lacks one, by expressing a wish for such a law to your representative and state senator, and/or to chairpersons of the proper state legislature committees. These laws require use of in-place seat belts.
- Inform yourself about your state belt law. If it needs improvement, convey that concern to elected state office holders.
- Remember, state and local police in many states have often been timid about enforcing seat belt laws. You can help them achieve more vigorous enforcement by contacting the relevant agency yourself or through concerned community groups.
- Encourage state engineering schools or similar organizations to conduct research into improved, more convenient, comfortable belt systems.

The Editors

Injury Severity of Passenger Car Occupants in Fatal Crashes, 1989



RESTRAINED* 20,641



UNRESTRAINED* 33,418

* Restrained includes 86 occupants whose injury severity was unknown. Unrestrained includes 134 with unknown severity. In addition, there were 7,697 occupants with unknown restraint use. Source: National Highway Traffic Safety Administration.

Capsule Briefs

are timely selections with broad reader interest

How Safe is the "Baby on Board"?

Not as safe as one might think, according to this 1991 report from the Centers for Disease Control. Greater use of infant seat-restraints has not resulted in a comparable reduction of infant deaths from car crashes. Infant seat-restraint use rose from 60 to 83 percent between 1983 and 1990. A recent study of child restraint laws, however, indicates their immediate benefit has been

to reduce fatalities by (only) 9 percent. Data are not yet available to explain why the gap is so large. [Child:en killed in fatal crashes may have been at greater risk for reasons such as parental driving behavior or more car travel-miles. - Ed.] (*Morbidity and Mortality Weekly Report*, August 30, 1991, 40(34):600-602.) □

Walking Under the Influence Can Be a Hazard to Your Health.

According to this federal report, in 1990 alcohol played a major role in fatal pedestrian accidents. It was found that "50 percent (3,254) of all pedestrian deaths involved some amount of alcohol." Persons in the 25-45 age group had over 30 percent of the fatalities, and 64 percent of them

had blood alcohol levels of 0.10 percent or higher—defining them, in most states, as legally intoxicated. (National Highway Traffic Safety Administration, U.S. Dept. of Transportation, *1990 Pedestrian Crash Facts*, August 1991.) □

How Good Are Child Care Safety Regulations in Your State?

If your child is among the 1.9 million cared for by an organized day care arrangement, and if you have always assumed that your state's safety regulations were adequate, you may be surprised by this study. A team of North Carolina investigators analyzed child care safety regulations in 45 states using a set of model regulations they

created. More than half the states surveyed were below standard or failed to mention two-thirds of the included items. Most notable was inattention to playground safety, choking hazards and firearms. (Runyan, C.W., Gray, D.E., et al, *Am J Pub Health*, 1991, 81(8):981-985.) □

Risk of Pancreatic Cancer: A Role for Dietary Fat?

Strong clues to the cause of pancreatic cancer—despite its high mortality—are very few. In this epidemiologic case-control study from Australia, the diets of persons with pancreatic cancer, for the year before diagnosis, were compared with age- and sex-matched control subjects. There were differences in dietary patterns that were probably not due to preclinical disease. Among them were

greater consumption of eggs and higher fat and dietary cholesterol intake for those with pancreatic cancer. The difference was partially due to greater reduction in egg consumption by the controls during the period under study. Fruit and vegetable consumption was also lower among cancer cases. (Baghurst, P.A., McMichael, A.J., et al, *Am J Epid*, 1991, 134(2):167-79.) □

Why Are Children Not Being Vaccinated for Measles?

This federal report shows that there are four main reasons for the current measles epidemic among poor, inner-city preschoolers. There are too many missed opportunities in medical care when children are seen, but providers fail to take advantage of the situation to immunize them. Barriers in the delivery system

prohibit drop-in visits, mandate physical exams prior to any immunization, or charge administrative fees. Limited access to care also occurs because of clinic charges. There is inadequate public awareness and lack of public demand for immunizations. (National Vaccine Advisory Committee, *JAMA*, 1991, 266(11):1547-1552.) □

Caruso's Controversial Fatal Illness.

Enrico Caruso, one of the great operatic tenors, died in Rome, August 2, 1921. (In this article, the author chronicles the controversy surrounding his fatal illness and its treatment.) A headline in an Italian newspaper the same day charged, "The American doctors killed him!" Medically, his death was caused by complications

from an abscess developing for several months earlier in the year. Although treated initially, it recurred, eventually causing fatal peritonitis. Caruso's death remains a gripping medical tale, with currently applicable lessons for famous people and the doctors who treat them. (Zorgniotti, A.W. *New York State J Med*, 1991, 91(8):347-357.) □

To Screen or Not to Screen, That is the Question.

Put another way, should women in the age 40-49 group routinely have mammography for early detection of breast cancer? The author, a highly regarded Canadian cancer epidemiologist, summarizes the current scientific evidence, and states that it is insufficient, at present, to warrant a

blanket recommendation. This conclusion, he notes, reinforces the decision of the U.S. Preventive Services Task Force, but contradicts the guidelines of the American Cancer Society and the National Cancer Institute. (Miller, A.B., *Am J Prev Med*, 1991, 7(1):55-62.) □

The Quality of Journals in Medical Care Administration.

Want to know which are considered the best publications in medical care administration? The question is not trivial for anyone who wants to keep up with that voluminous literature. In this article, the authors report the results of an ingenious analysis. Using a list of 53 journals, they surveyed heads of academic departments in health care administration in the United States, Canada, and

Puerto Rico, asking them to rate the level of achievement of faculty members who published in each journal. The leaders in the category health policy, research, planning/medicine, were (in descending order): *New Eng J Med*, *Health Services Research*, *Medical Care*, and *The Milbank Quarterly*. (Brooks, C.H., Walker, L.R., and Szorady, R., *Medical Care*, 1991, 29(8):755-765.) □

Charges for a Cesarean Section: United States, 1990

RECAP

Cesarean Section Charges

Based on MetLife experience during 1990, close to 30 percent of all births to group policyholders' employees and dependents were by cesarean section costing, on average, \$8,530. Cesarean costs in Washington, D.C. and Connecticut were the highest — each more than 30 percent above the U.S. average.

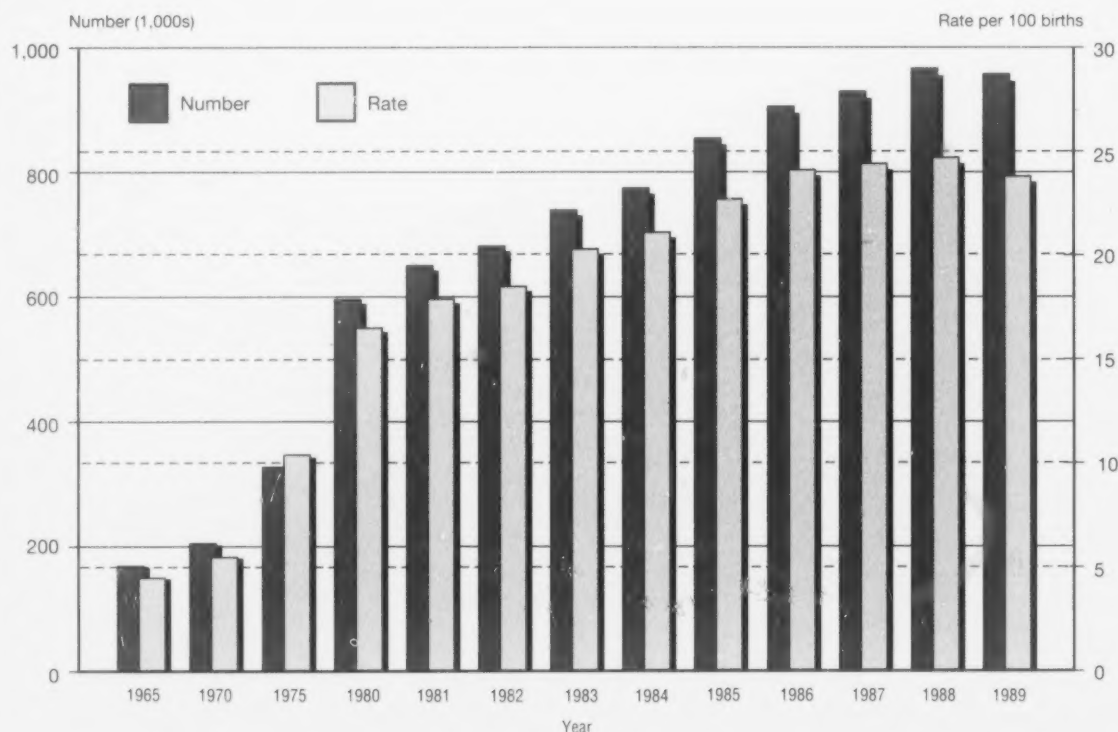
Among states with at least 50 C-sections, Ohio, Iowa, Mississippi, Arkansas and Oklahoma had the lowest charges—at least 22 percent lower than the norm. Physician fees made up 38 percent of the total charges, and varied from a high of \$5,090 in New York to lows of \$1,810 and \$1,900 in Arkansas and South Carolina, respectively. Ancillary fees averaged 60 percent of the hospital charges with substantial variation by state. □

After more than two decades of rising cesarean section (C-section) rates in the United States, 1989 marked the first year that both the numbers and rates decreased.^{1,2} Rates reached an all-time high in 1988 (24.7 per 100 births) with 966,000 performed in short-stay hospitals across the United States. Cesareans result in hospital stays and total costs almost twice those of a normal vaginal delivery and, currently, C-sections account for about one in every four U.S. births.^{1,3} The rates remain high despite major educational efforts to decrease primary as well as repeat cesareans. VBACs (vaginal birth after a previous cesarean) continue to be recommended for certain women, but their rates are increasing only very slowly across the country.^{4,5}

While C-sections continue to be the most common major surgical procedure performed in the United States, their rates may be plateauing. There was no significant increase in their rates between 1986 and 1988 and, indeed, in 1989 both numbers and rates decreased.⁶ In 1989 cesarean births dropped 1 percent to 957,000 with a concomitant 4 percent drop in rate per 100 births to 23.8 (Figure A). This latest rate represents the lowest cesarean birth rate since 1985. Encouraging as this decreased rate is, experts agree that there is no easily defined nor universally accepted "optimal" rate for cesarean deliveries. During the past 25 years, there have been dramatic increases in C-section rates experienced in all regions of the country and by women of all ages, races, marital statuses and by hospital sizes and types.

Increased professional attention has recently been given to C-section indications. Concern about the attendant recovery time and morbidity rates, plus the increased medical/surgical costs associated with these deliveries, led to a "consensus"

**Figure A—Cesarean Section Numbers and Rates, United States
Selected Years, 1965-1989**



Source: National Center for Health Statistics, various reports of National Hospital Discharge Surveys.

conference and the issuing of guidelines relaxing criteria for trials of labor and VBACs.^{4,5} Nonetheless, cesarean rates continued rising until just recently.

As increasing attention is paid to the changes in C-section rates across the country, the costs associated with these surgeries are also being investigated. For instance, reasons for the variations in prevalence rates are being sought as well as explanations for persistent cost differentials among regions and between states. As part of this latter effort, MetLife continues its review of costs associated with common surgical procedures, in general, and cesarean childbirth, in particular.

Cesareans accounted for close to 30 percent of all MetLife insured births in 1990, down 4 percent from 1989.

Metropolitan Life Study

Corporate Health Strategies, Inc., a subsidiary of MetLife, linked hospital and physician claims for cesareans performed during 1990 on employees and dependents insured under MetLife group health contracts. Cesareans were defined by

**Table 1—Geographic Distribution of Births
and Proportions Due to Cesarean Section
Metropolitan Life Insurance Company Group Health Claims, 1990**

Geographic Area	Total Births		Cesarean Births		
	Number	Percent	Number	Percent	Percent of Total Births
United States	44,570	100.0	13,214	100.0	29.6
New England	2,480	5.6	635	4.8	25.6
Connecticut	1,014	2.3	274	2.1	27.0
Massachusetts	699	1.6	181	1.4	25.9
Maine	179	0.4	40	0.3	22.3
New Hampshire	289	0.6	70	0.5	24.2
Rhode Island	160	0.4	32	0.2	20.0
Vermont	139	0.3	38	0.3	27.3
Middle Atlantic	5,001	11.2	1,713	13.0	34.3
New Jersey	1,903	4.3	599	4.5	31.5
New York	1,780	4.0	777	5.9	43.7
Pennsylvania	1,318	2.9	337	2.6	25.6
East North Central	8,753	19.6	2,343	17.7	26.8
Illinois	2,840	6.3	750	5.7	26.4
Indiana	929	2.1	228	1.7	24.5
Michigan	939	2.1	295	2.2	31.4
Ohio	3,108	7.0	885	6.7	28.5
Wisconsin	937	2.1	185	1.4	19.7
West North Central	2,204	5.0	520	4.0	23.6
Iowa	383	0.9	79	0.6	20.6
Kansas	380	0.8	91	0.7	23.9
Minnesota	338	0.8	88	0.7	26.0
Missouri	879	2.0	220	1.7	25.0
North Dakota	37	0.1	6	0.0	16.2
Nebraska	132	0.3	29	0.2	22.0
South Dakota	55	0.1	7	0.1	12.7
South Atlantic	9,007	20.2	2,769	21.0	30.7
District of Columbia	178	0.4	71	0.5	39.9
Delaware	121	0.3	34	0.3	28.1
Florida	3,214	7.2	1,105	8.4	34.4
Georgia	1,593	3.6	497	3.8	31.2
Maryland	565	1.3	155	1.2	27.4
North Carolina	1,285	2.9	361	2.7	28.1
South Carolina	541	1.2	151	1.1	27.9
Virginia	1,230	2.7	308	2.3	25.0
West Virginia	280	0.6	87	0.7	31.1
East South Central	2,691	6.0	802	6.0	29.8
Alabama	460	1.0	148	1.1	32.2
Kentucky	660	1.5	186	1.4	28.2
Mississippi	385	0.9	118	0.9	30.6
Tennessee	1,186	2.6	350	2.6	29.5
West South Central	7,262	16.3	2,416	18.2	33.3
Arkansas	366	0.8	111	0.8	30.3
Louisiana	905	2.1	355	2.7	39.2
Oklahoma	593	1.3	169	1.2	28.5
Texas	5,398	12.1	1,781	13.5	33.0
Mountain	1,907	4.3	447	3.4	23.4
Arizona	489	1.1	138	1.0	28.2
Colorado	503	1.1	106	0.8	21.1
Idaho	90	0.2	22	0.2	24.4
Montana	86	0.2	21	0.2	24.4
New Mexico	186	0.4	48	0.4	25.6
Nevada	193	0.5	46	0.3	23.8
Utah	281	0.6	48	0.4	17.1
Wyoming	79	0.2	18	0.1	22.8
Pacific	5,265	11.8	1,569	11.9	29.8
Alaska	56	0.1	13	0.1	23.2
California	4,218	9.5	1,332	10.1	31.6
Hawaii	50	0.1	9	0.1	18.0
Oregon	330	0.7	64	0.5	19.4
Washington	611	1.4	151	1.1	24.7

Source: Claims data from Metropolitan Life Insurance Company merged and edited by Corporate Health Strategies, Inc.
Analyses and computations by the Health and Safety Education Division, MetLife.

CPT-4 (*Physicians' Current Procedural Terminology*—Fourth edition) codes 59400-59410, and totalled 13,328 in 1990. Charges associated with the 13,214 typical* and uncomplicated C-sections form the basis of the following analyses. (A total of 114 claims had inaccurate or conflicting state and/or geographic area data and were thus excluded from this analysis.) Average

Metropolitan claims data showed average charges for a cesarean delivery to be \$8,530 in 1990.

medical/surgical and hospital charges are presented by state and geographic area for women between the ages of 15 and 46 (median age was 29.6). Also excluded from the analyses were 15 states in which fewer than 50 cesareans were performed in the insured group. The 35 remaining states plus the District of Columbia represent 12,803 deliveries or 96 percent of the reported cases.

Proportion of Births by Cesarean Section

MetLife processed a slightly larger number of claims for cesareans in 1990 than in 1989 (13,328 versus 12,381, respectively). While their absolute numbers increased, their proportion of total births decreased 4 percent in 1990—a decrease similar to that being experienced nationwide. Of all MetLife-insured births during 1990, close to 30 percent were by cesarean section. This proportion varied considerably by geographic region and state but was

* "Typical" surgeries exclude length-of-stay outliers and fall within 97.2 percent of the usual length-of-stay outlined in the diagnosis related group (DRG) criteria.

generally in accord with recently reported national data.⁹ That is, proportionately more of the births were by cesarean in the Northeast and South (each more than 31 percent) than were in the Midwest or West (26 and 28 percent, respectively). As seen in Table 1, New York had the largest proportion of C-sections (43.7 percent) with the District of Columbia and Louisiana close behind with 39.9 and 39.2 percent of total births, respectively. Among the states with at least 50 MetLife-insured cesarean deliveries, Oregon and Wisconsin had the smallest proportion of such births, i.e., about 19 percent, each, in 1990. Similar proportions were evident in 1989, e.g., cesareans accounted for 31 percent of the total insured births, with New York and Wisconsin representing the extremes in the range, 46 and 19 percent, respectively (data not shown).

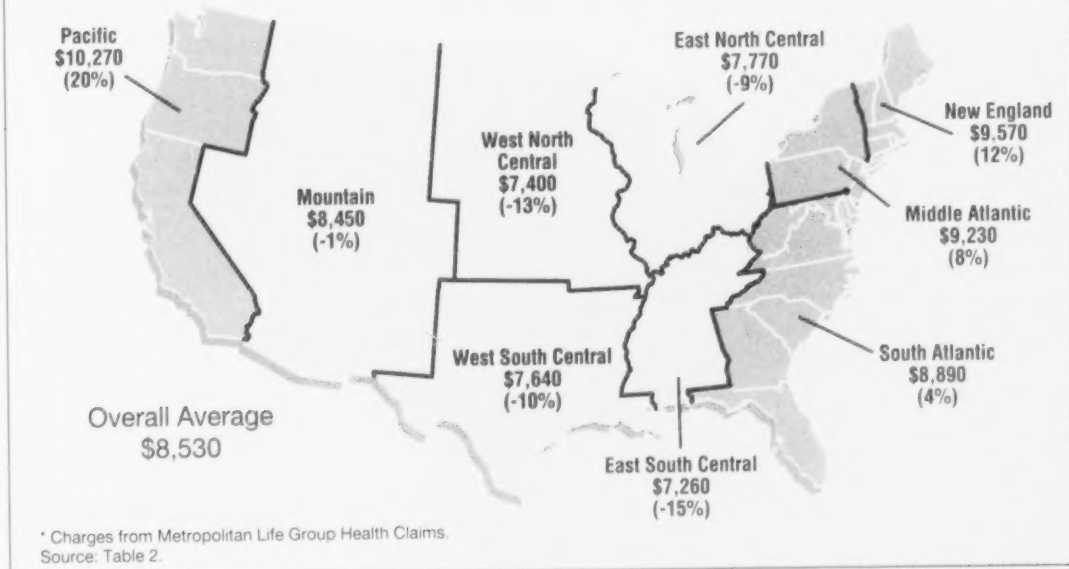
Cost Variation by Region

Average charges for a cesarean birth in 1990 totaled \$8,530 with marked variation among regions (Figure B). The Pacific area led in average charges; its total was \$10,270 or 20 percent above the nation's

The District of Columbia and Connecticut registered the highest average total charges for a cesarean birth.

average. The New England area had the second highest average total charge with an amount 12 percent higher than average and \$700 less than the Pacific charges. Only two other divisions (the Middle Atlantic and the South Atlantic) had average total C-section charges above that for the entire country—charges 8 and 4 percent, respectively, above the U.S.

Figure B—Cesarean Section Charges* by Geographic Area and Percent Difference From Overall Average, 1990



average. Only \$140 separated the average total charges in the divisions with the two lowest amounts. The lowest costs were in the East South Central area, where they averaged \$7,260. These low charges were 15 percent below those for the United States and \$3,010 lower (or 29 percent below) the high charges in the Pacific. The West North Central area had the second lowest average charges for a cesarean (13 percent below the norm) followed by the West South Central, where the charges averaged 10 percent lower.

State Variations in Costs

Between states, total charges differed by as much as 74 percent (Table 2). The District of Columbia and Connecticut led in total costs, each with cesarean charges in excess of \$11,000—more than 30 percent higher than the average total for the United States. California followed closely with total charges also in five figures and 25 percent above the average. Illinois, Florida and

New York were the only other states with charges 10 percent or more above the U.S. average.

The lowest average total cesarean cost was found in Ohio, where the charges totaled \$6,500, 24 percent lower than the norm. This low was followed by the charges in Iowa, Mississippi, Arkansas and Oklahoma, each with totals at least 22 percent lower than average.

Physician and Hospital Charges

On average, 62 percent of the total insurance charges for a cesarean birth were attributed to hospital costs (room and board plus ancillary fees). These costs averaged \$5,290 across the country but ranged from less than half of the total paid charges in New York and Maryland to 73 percent in South Carolina and 72 percent each in Minnesota and Arkansas. Ancillary charges (i.e., operating room, laboratory, bloodbank, pharmacy fees, etc.) averaged \$3,200 or 60 percent of the hospital bill.

**Table 2—Average Charges for a Typical* Cesarean Birth
Metropolitan Life Insurance Company Group Health Claims, 1990**

	Average Charges (\$)					Average Length of Stay (Days)	Percentage	
	Total Hospital & Physician	Hospital Charge			Physician Charge		Hospital of Total	Ancillary of Hospital
		Total	Room & Board	Ancillary				
United States	8,530	5,290	2,090†	3,200†	3,240	4.4	62	60
New England	9,570	6,080	2,770	3,310	3,490	5.2	64	54
Connecticut	11,180	7,300	3,360	3,940	3,880	5.8	65	54
Massachusetts	9,050	5,360	2,460	2,900	3,690	5.0	59	54
New Hampshire	8,250	5,230	2,090	3,140	3,020	4.3	63	60
Middle Atlantic	9,230	4,960	2,470†	2,490†	4,270	5.2	54	50
New Jersey	8,460	4,520	1,990‡	2,530‡	3,940	5.4	53	56
New York	9,860	4,770	2,620‡	2,150‡	5,090	5.2	48	45
Pennsylvania	9,140	6,190	2,980	3,210	2,950	5.0	68	52
East North Central	7,770	5,120	2,140	2,980	2,650	4.3	66	58
Illinois	9,560	6,290	2,490	3,800	3,270	4.5	66	60
Indiana	7,000	4,780	1,600	3,180	2,220	4.3	68	67
Michigan	8,080	5,760	2,170	3,590	2,320	4.5	71	62
Ohio	6,590	4,200	2,100	2,100	2,390	3.9	64	50
Wisconsin	6,990	4,640	1,530	3,110	2,350	4.8	66	67
West North Central	7,400	5,000	1,820	3,180	2,400	4.3	68	64
Iowa	6,530	4,400	1,530	2,870	2,130	4.2	67	65
Kansas	7,040	4,470	1,490	2,980	2,570	3.8	63	67
Minnesota	7,240	5,200	1,730	3,470	2,040	4.5	72	67
Missouri	7,910	5,270	2,110	3,160	2,640	4.3	67	60
South Atlantic	8,890	5,300	1,940	3,360	3,590	4.3	60	63
District of Columbia	11,320	7,270	3,150	4,120	4,050	5.0	64	57
Florida	10,260	5,830	2,600	3,230	4,430	4.5	57	55
Georgia	8,770	5,250	1,410	3,840	3,520	4.1	60	73
Maryland	7,670	3,750	1,790	1,960	3,920	4.2	49	52
North Carolina	7,230	4,700	1,260	3,440	2,530	4.3	65	73
South Carolina	6,950	5,050	1,280	3,770	1,900	4.1	73	75
Virginia	8,660	4,820	1,440	3,380	3,840	4.2	56	70
West Virginia	7,070	4,540	1,460	3,080	2,530	4.4	64	68
East South Central	7,260	4,870	1,320	3,550	2,390	4.2	67	73
Alabama	9,180	6,380	1,480	4,900	2,800	4.3	69	77
Kentucky	6,950	4,440	1,610	2,830	2,510	4.0	64	64
Mississippi	6,580	4,400	1,050	3,350	2,180	4.5	67	76
Tennessee	6,860	4,630	1,200	3,430	2,230	4.0	67	74
West South Central	7,640	4,850	1,480	3,370	2,790	4.1	63	69
Arkansas	6,560	4,750	1,110	3,640	1,810	3.9	72	77
Louisiana	7,640	5,010	1,300	3,710	2,630	3.8	66	74
Oklahoma	6,640	4,270	1,660	2,610	2,370	4.4	64	61
Texas	7,800	4,860	1,520	3,360	2,920	4.1	63	69
Mountain	8,450	5,370	2,120	3,250	3,080	4.1	64	61
Arizona	9,350	5,640	2,150	3,490	3,710	4.0	60	62
Colorado	8,840	5,760	2,440	3,320	3,080	4.2	65	58
Pacific	10,270	6,510	2,980	3,530	3,760	4.0	63	54
California	10,640	6,770	3,080	3,690	3,870	4.0	64	55
Oregon	8,500	5,720	2,950	2,770	2,780	4.7	67	48
Washington	8,120	4,690	2,290	2,400	3,430	4.2	58	51

Note: Excludes states with fewer than 50 cases.

* "Typical" deliveries are exclusive of outliers according to DRG guidelines.

† Reflects estimates in New Jersey and New York.

‡ Estimated by MetLife Health and Safety Education personnel based on 1989 distribution of charges.

Source: Claims data from Metropolitan Life Insurance Company merged and edited by Corporate Health Strategies, Inc.

Analyses and computations by the Health and Safety Education Division, MetLife.

This proportion also varied substantially by state, ranging from 77 percent of the hospital charges in Alabama and Arkansas to less than half in Ohio, Oregon and New York.

Physician fees averaged \$3,240 with extensive variation both between states and geographic regions. The doctors' bills in New York were the highest and totaled close to \$5,100—an amount 57 percent above the norm. The state with the second highest physician fees for a cesarean birth was Florida, where the bill averaged \$4,430, 37 percent above the average. The Middle Atlantic and Pacific areas had the two highest regional physician charges, 32 and 16 percent, respectively, above the U.S. average. The lowest regional charge for a cesarean was found in the East South Central area, where the doctors' bills averaged \$2,390, 26 percent below the U.S. norm and 44 percent lower than that in the Middle Atlantic area. Arkansas and South Carolina reported the lowest physician fees, each with averages under \$2,000, or between 41 and 44 percent lower than the U.S. norm.

The lowest average charges were in Ohio, Iowa, Mississippi, Arkansas and Oklahoma.

Substantial between-state variation in length of stay was also reported. While the U.S. average hospital stay was 4.4 days, Connecticut reported almost six days (5.8) of hospitalization for a cesarean section. The shortest hospital stay was in Kansas, where the women were discharged 3.8 days after being admitted.

Will the observed recent national decreases in cesarean rates persist? Private and public insurance payers as well as members of the obstetric community, health economists, statisticians and the public at large will be watching rates—and fees—with great interest. Monitoring of the complex total cesarean picture needs to be continued and the recommendations of the NIH consensus conference further disseminated. Clearly, elimination of unnecessary surgery is in the health interest of mothers and babies and in the financial interest of the nation. □

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Developments in Medical Care Costs

RECAP

Future of Health Care

High and spiraling costs remain a key issue in the ongoing debate over health care in the United States, and will continue to be a driving force behind changes in medical care delivery. As the share of the nation's economic resources devoted to health care keeps rising, resistance against these higher costs is increasing among all sectors involved—business, households and government. The interaction of this resistance with health care goals, such as the availability of quality care, will play a major role in the future direction of the health care system in the United States. □

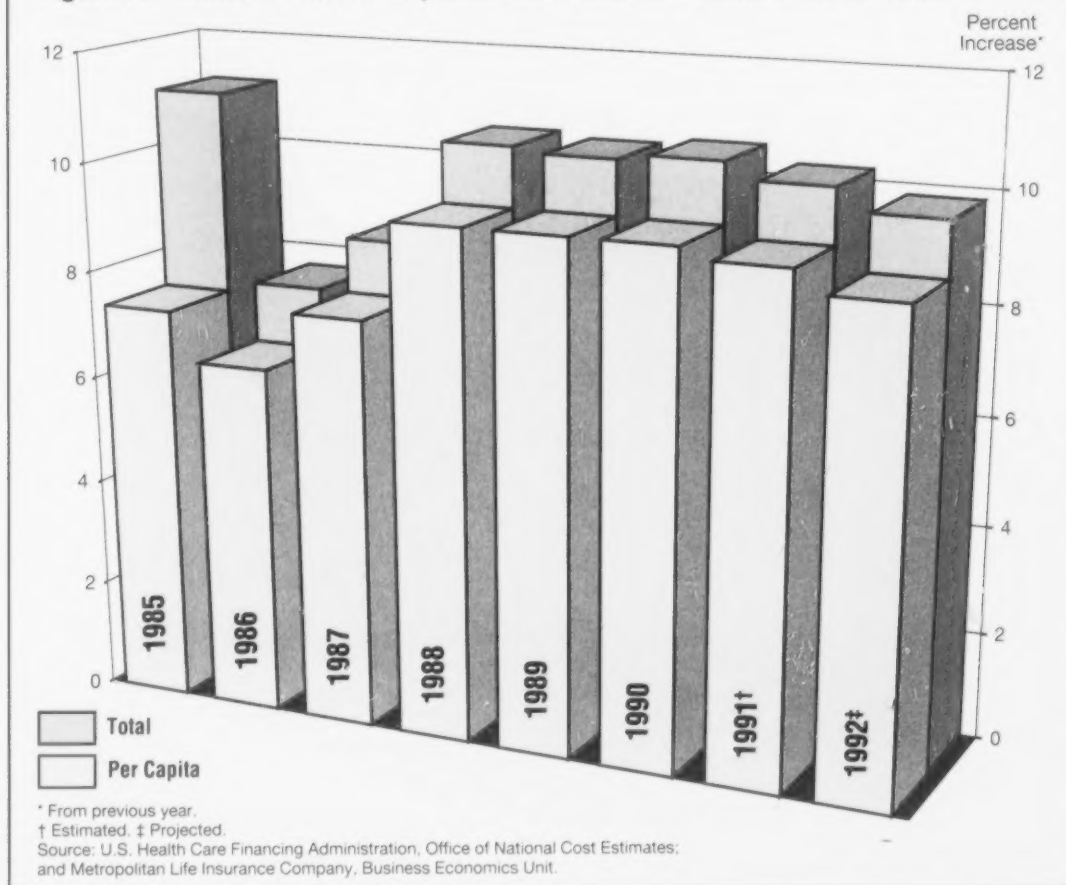
The debate concerning health care in the United States remains intense and is likely to become even more so during this presidential election year. Currently, the discussion has branched into two main issues—the availability of quality care and high and rising costs. The cost issue has been a driving force behind much of the changing landscape that has occurred in health care delivery in the United States. While it should be noted that these and other issues regarding medical care are not mutually exclusive, this article will concentrate on the expenditure aspects of health care and their possible ramifications.

National Health Expenditures

Medical care expenditures continue to rise rapidly despite numerous "cost-containment" efforts to counter their escalation and, more recently, the movement toward managed care. The latest available data from the Health Care Financing Administration (HCFA) show that in 1990 the United States spent \$666.2 billion on health care. As shown in Figure A, this represented an increase of 10.5 percent over 1989 and was the third year in a row of double-digit gains. Available indicators point to another increase of about 10 percent in 1991, and there do not appear to be any factors to suggest any marked deceleration this year. For 1992 expenditures are expected to rise 9.7 percent, reaching about \$805 billion.

Expenditures for personal health care, which exclude expenses for administration, government health activities, research and construction, also increased by 10.5 percent in 1990 and amounted to \$585.3 billion (See Table 1). The increase was significantly higher than the previous year and the sharpest since 1985. Hospital care, which is the largest component of personal health care expenditures, recorded an increase of 10.1 percent in 1990.

Figure A—National Health Expenditures, United States, 1985 to 1992



However, its share of the total, which was 43.7 percent in 1990, continued to edge lower. Spending on physicians' services, the second major category in terms of costs, grew by 10.7 percent in 1990.

Table 1 also discloses that, among the smaller categories, sharp gains continued to be recorded by "other professional services" and home health care. Cost-containment efforts that aim at shorter hospital stays and increased treatment on an outpatient basis should continue to push these expenditures up sharply. Nevertheless, their combined

share is still relatively small, amounting to just over one-fifteenth of all personal health care expenditures. Nursing home care costs

In 1990 the United States spent \$666.2 billion on health care.

recorded an increase of over 11 percent for the second year in a row. This followed three years of more moderate increases. Despite the sharp rise in drug prices, as

Developments in Medical Care Costs

measured in the Consumer Price Index, drugs and other nondurables recorded a

Sharp gains continued to be recorded by "other professional services" and home health care.

relatively moderate increase in 1990, as did vision products and other equipment. Dentists' services also can be placed with the groups showing a moderate increase.

On a per capita basis, national health expenditures increased by 9.4 percent in 1990 to \$2,566. As is shown by the percent change in per capita spending in Figure A, population growth accounts for a relatively small portion of the annual increase in medical care costs. Of course, demographics play a somewhat larger role than that indicated by just the increase in population. It is a well-established fact that, in general, a disproportionate share of a person's lifetime expenditures for health care takes place in the latter years. Thus, the fact that the number of persons 75 years and over increased sharply between 1980 and 1990 suggests some impact on the

**Table 1—Comparison of Total Expenditures on Personal Health Care*
United States, 1980 to 1990**

	\$ Billion	Percent Change from Previous Year		Percent Distribution	
		1989	1990	1980	1990
Personal Health Care	585.3	9.8	10.5	100.0	100.0
Hospital Care	256.0	9.7	10.1	46.6	43.7
Physicians' Services	125.7	8.0	10.7	19.1	21.5
Dentists' Services	34.0	7.3	7.6	6.6	5.8
Other Professional Services	31.6	14.0	16.6	4.0	5.4
Home Health Care	6.9	25.5	22.5	0.6	1.2
Drugs and Other Medical Nondurables	54.6	9.3	7.9	9.8	9.3
Vision Products and Other Medical Nondurables	12.1	12.9	6.1	2.1	2.1
Nursing Home Care	53.1	11.5	11.4	9.1	9.1
Other Personal Health Care	11.3	11.2	16.4	2.1	1.9

* Does not include outlays for research and construction, expenses for prepayment and administration, and government public health activities.
Source: U.S. Health Care Financing Administration, Office of National Cost Estimates.

**Table 2—Percent Change from Previous Year
in Selected Items of Medical Care Consumer Price Index (CPI)
United States, 1982 to 1992**

Item	Annual Averages										
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991*	1992†
Prescription Drugs	11.6	11.0	9.6	9.5	8.6	8.0	8.0	8.7	10.0	10.0	9.6
Physicians' Services	9.4	7.8	6.9	5.9	7.2	7.3	7.2	7.4	7.1	6.0	5.5
Hospital Rooms	15.7	11.3	8.3	5.9	6.0	7.2	9.3	10.3	10.9	9.4	8.3
Dental Services	7.6	6.8	8.1	6.2	5.6	6.8	6.8	6.3	6.6	7.5	7.5
Medical Care: All Items	11.6	8.8	6.2	6.3	7.5	6.6	6.5	7.7	9.0	8.7	7.9
Total CPI	6.2	3.2	4.3	3.6	1.9	3.6	4.1	4.8	5.4	4.2	3.7

*Estimated.

† Projected.

Source: U.S. Bureau of Labor Statistics and Metropolitan Life Insurance Company, Business Economics Unit.

cost increase witnessed during this period. However, the bulk of the rise must still be linked to higher prices.

Medical Care Prices

Over the years, about 70 percent of the rise in health care expenditures can be attributed to higher prices for medical care goods and services. As shown in Table 2, medical care inflation has consistently outpaced inflation for the overall economy. The table also shows that medical care inflation slowed in 1991.* The deceleration was most evident in prices for physicians' services. Nevertheless, the rise in the

A disproportionate share of a person's lifetime expenditures for health care takes place in the latter years.

medical care component of the Consumer Price Index for the year still exceeded the increases witnessed during the 1984 to 1989 period. Furthermore, despite the lower increase in medical care prices, the gap with the overall CPI widened further in 1991.

* The CPI measures price changes for a specific market basket of consumer goods and services. The difference in importance among various items between the medical care CPI and health insurance plans explains, in large part, why cost experiences have shown gains substantially greater than the medical CPI. Other factors include higher utilization and the rise in catastrophic cases.

Doctors' fees rose by about 6.0 percent in 1991 compared to annual increases of over 7.0 percent during the past five years. This, in part, could be a reflection of the increased attention focused on the cost of physicians' services by insurance carriers and employers. Although continuing to rise sharply, prices for hospital rooms also showed some easing—rising by 9.4 percent in 1991, following increases of over 10 percent for the previous two years. However, prices for other hospital services—both inpatient and outpatient—continued to rise at double-digit rates.

Medical care cost inflation has consistently exceeded inflation for the overall economy.

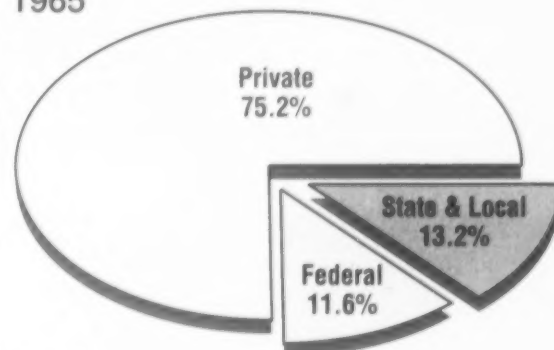
Among other major categories, prescription drugs continued to show steep price increases, with back-to-back 10 percent gains. Dental fees recorded their sharpest increase since 1984.

This year, on an annual average basis, the medical care CPI is expected to ease further, with the reduction in inflation most evident in the hospital sector. Unfortunately, although narrowing slightly, the gap with the overall CPI is expected to remain high.

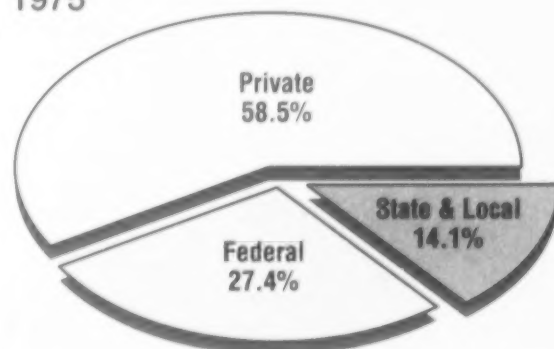
Besides inflation, higher medical care prices reflect significant gains in technology. New and advanced procedures in this sector are frequently more expensive—at times by a wide margin. These situations represent a prime example of when the aspects of quality and costs become intertwined. In addition to technology advances, other factors behind higher medical care costs include increased utilization and rise in catastrophe cases.

**Figure B—Percent Personal Health Care Expenditures by Source of Funds
United States, 1965, 1975, and 1990**

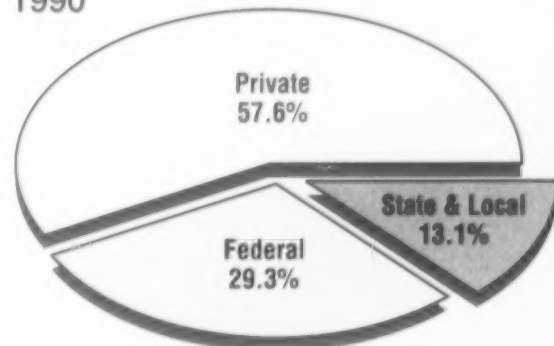
1965



1975



1990



Source: U.S. Health Care Financing Administration, Office of National Cost Estimates.

Health Care and Economic Resources

Because of the 1990-91 economic recession, the often quoted statistic "health expenditures as a percentage of GNP" surged to almost 13 percent in 1991 from 12.2 percent* in 1990. Just 10 years prior, health care represented 9.5 percent of the nation's output of goods and services. The share will move even higher this year, approaching 13.5 percent. This will, no doubt, heighten concerns over the cost of health care and the burden it is placing on economic resources. Furthermore, current estimates indicate that the measure will rise to over 16 percent by the year 2000.[†] How the country will pay for health care and make more efficient use of resources are key issues being discussed in the ongoing debate regarding the delivery of medical care.

Another indication of the greater use of resources being absorbed by the health care sector is the sharp gain in health services employment. The number of employees in this sector has continued to rise sharply in the midst of the recession and now accounts for 7.6 percent of total nonfarm employment. Furthermore, since 1980, such employment has represented more than 16 percent of the gain in jobs.

Sources of Funds for Health Care

Traditionally, attempts to answer how health care is paid for have examined a breakdown of funds by final sources—those making payment to health care providers. Following the onset of Medicare and Medicaid in the mid-1960s, there was a distinct shift in the source of funds for

final expenditures from the private to the public sector. (See Figure B.) However, since 1975, the share represented by public funds has shown little increase despite the growth in the "aged" population. This reflects the constraint placed on these expenditures by government fiscal difficulties. Continuing budget problems at both the federal and local levels will further restrain government expenditures in the health care area. Unfortunately, much of this will not represent a more efficient use of resources but just a cost shift in final source of funds to different groups. The share represented by private funds amounted to just under 58 percent in 1990. This was only slightly less than in 1975, but a considerably lower share than in 1965. However, within the private grouping, health insurance has represented an increasing amount. In 1990 insurance accounted for more than half of the funds from private sources, compared with less than one-third in 1965.

Current estimates indicate that health expenditures as a percentage of GNP will rise to over 16 percent by the year 2000.

Health Care Costs: Who Really Is Paying?

Although government is looked upon as a source of funds for health care expenditures, it must be remembered that these funds originate from other sectors—namely, households (individuals) and businesses. A useful concept put forth in studies by HCFA rearranges funds by payer category to determine actual cost burdens for each sector;¹ these are presented in Table 3. This concept displays several

* Based on data prior to government's comprehensive revision of National Income and Product Accounts.

† Latest long-term projections available from the Health Care Financing Administration.

**Table 3—Percent Distribution of Expenditures
for Health Services and Supplies for Private and Public Payers
United States, 1965 to 1989**

Type of Payer	1965	1970	1975	1980	1985	1989
Total	100	100	100	100	100	100
Private	79	73	69	68	69	70
Private Business	17	22	24	28	29	30
Private Health Insurance	14	16	18	21	22	22
Households	60	49	43	37	37	37
Nonpatient Revenue	2	2	2	3	3	3
Public	21	27	31	32	31	30
Federal	9	15	17	18	17	16
State and Local	12	12	14	14	14	14

Source: U. S. Health Care Financing Administration, Office of the Actuary.

interesting findings. First, in 1989, out-of-pocket expenditures and insurance premiums paid by households accounted for roughly 37 percent of the funds that ultimately go for medical care services and supplies. While this percentage has remained stable during the past decade, it is significantly lower than in 1965. To some degree, the data still dispel the notion that expenditures by individuals for health care are minimal. These expenditures now represent roughly 5 percent of personal income, up from close to 4 percent in 1965. Nevertheless, because of the rising impact of insurance, the consumer has been further distanced from cost/benefit decisions.

As a percent of before-tax corporate profits, business expenditure for health care has increased from 8.4 percent in 1965 to over 50 percent in 1989.

Currently, private businesses pay roughly 30 percent of health care costs—up from 17 percent in 1965. Why has this rise been so sharp? Business costs primarily take the form of insurance premiums—whether for self insurance or premiums to

third parties—and contributions to Medicare. Health benefits have become an important aspect of employment decisions. Several polls clearly indicate the high value placed on these benefits by employees. Nevertheless, because of escalating costs, they have also become an important bottom-line issue. As a percent of before-tax corporate profits, business expenditures for health care have increased from 8.4 percent in 1965 to over 50 percent in 1989. The problem is particularly acute for small business. This dilemma has begun to receive widespread attention. Current estimates place the number of people without health insurance at about 35 million, and a large portion of these are employees of small firms.

Unlimited resources are
not available to attain all
possible health care goals.

The impact of retiree health benefits accounts for part of the increasing cost burden for business. This was recently highlighted by the Federal Accounting Standards Board ruling that future liabilities must be accounted for in current financial statements. Several major firms have already taken large write-offs. According to some estimates, the new rule would bring retiree health care costs to \$2,500 per employee. Because of the new ruling and the rapid rise in current expenditures, corporations have begun to seriously rethink their policies on retiree health benefits.

Table 3 also shows that between 1965 and 1989 the share of health care costs paid by the public sector increased from 21 to 30 percent. This is much less than the rise based on the usual source of funds

analysis. Most of the increase was in the federal government bracket, and represented increased payments to the states for Medicaid. However, this analysis based on payer categories can theoretically be taken a step further, since the funds for the expenditures being attributed to the public sector come from general tax revenue.

Conclusion

Cost burdens will continue to play a crucial role in health care issue developments. Those involved are realizing that compromises will be necessary to arrive at solutions. As the ramifications of spiraling expenditures clearly demonstrate, unlimited resources are not available to attain all possible health care goals. Thus, attempts at solutions should revolve around trying to allocate resources as efficiently and as fairly as possible. In any event, developments regarding costs will necessitate difficult decisions for all sectors. ■

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STATISTICAL INFORMATION, PLEASE

Q What is the average income of the traditional-earner family and the dual-earner family, and how has this changed in the past decade?

A Data from the Bureau of the Census show that the "dual-earner family" (married couple family in which both spouses are in the labor force) generally has substantially higher income than the "traditional family" (in which only the husband is in the labor force). In 1989 the average earnings, when both husband and wife were in the labor force, was \$46,554, or almost one-third higher than that of the traditional family with income of \$35,810. A decade earlier, the disparity was somewhat smaller, with earnings of \$25,552 vs. \$21,150.

Q Among men and women aged 65 and over, what are the five leading causes of deaths due to unintentional injury in the United States?

A Unintentional injury deaths were the seventh leading cause among persons aged 65 and over in 1988, and accounted for almost 27,000 fatalities. Of these, deaths from falls ranked first followed by motor vehicles; combined, these two causes were responsible for three in five of all such deaths at ages 65 and over. The following table gives the ranking of the five leading causes of unintentional injury deaths for persons aged 65 and older, by sex.

**Unintentional Injury Mortality by Leading Type
Persons Aged 65 and Over
by Sex, United States 1988**

	Total		Men		Women	
	Number	Rate	Number	Rate	Number	Rate
All Deaths	26,996	88.9	13,689	110.8	13,307	73.9
Falls	9,060 (1)	29.8	3,869 (2)	31.3	5,191 (1)	28.8
Motor vehicle	7,159 (2)	23.6	4,078 (1)	33.0	3,081 (2)	17.1
Ingestion of food, object	2,559 (3)	8.4	1,207 (3)	9.8	1,352 (3)	7.5
Surgical, medical complications	2,022 (4)	6.7	928 (4)	7.5	1,094 (4)	6.1
Fire and flame	1,487 (5)	4.9	806 (5)	6.5	681 (5)	3.8

Note: Number in parenthesis denotes the ranking. Crude rates per 100,000 population.
Source: Rates computed by the Health and Safety Education Division of the Metropolitan Life Insurance Company, based on data from the National Center for Health Statistics and the Bureau of the Census.

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Historical Perspectives

United States Center of Population, 1790-1990

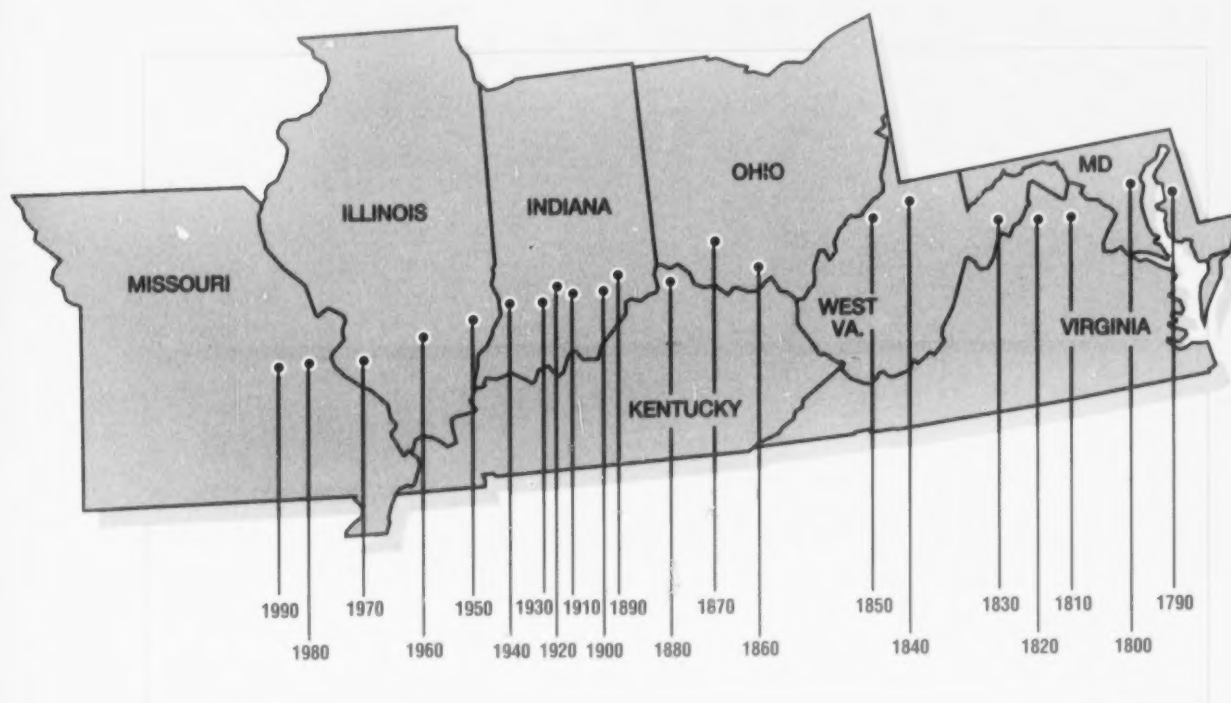
Since the first official census in 1790, the U.S. center of population has steadily moved in a southwesterly direction and now lies in Crawford County, Missouri. (The "center of population" as defined by the Bureau of the Census is that point "where an imaginary, flat, weightless and rigid map of the United States would balance perfectly if all 248,709,873 residents were of identical weight.")

The centers of population since the first census in 1790 are located near the following cities or towns:

1790—Chestertown, Maryland
1800—Baltimore, Maryland
1810—Leesburg, Virginia
1820—Moorefield, Virginia
1830—Petersburg, West Virginia
1840—Clarksburg, West Virginia

1850—Parkersburg, West Virginia
1860—Portsmouth, Ohio
1870—Hillsboro, Ohio
1880—Covington, Kentucky
1890—Greensburg, Indiana
1900—Columbus, Indiana
1910—Bloomington, Indiana
1920—Spencer, Indiana
1930—Linton, Indiana
1940—Carlisle, Indiana
1950—Olney, Illinois
1960—Centralia, Illinois
1970—Mascoutah, Illinois
1980—De Soto, Missouri
1990—Steelville, Missouri

The following map highlights the eight states in which the population centers have been located since the start in Chestertown, Maryland in 1790.





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2 Changing Racial Composition of Metropolitan Areas

The number of Hispanics, Asians and Pacific Islanders has increased remarkably in the past decade.

10 AIDS: A Comparison of Knowledge and Attitudes Among Black, Hispanic and White Americans, 1990

20 Selected Demographic and Health Characteristics—State Variations 1988-1991

28 Use of Survey Data in a Corporatewide Health Promotion Program: The MetLife Experience



Contents

Statistical Bulletin Vol. 73, No. 2, Apr-Jun 1992

- 1 From the Editor's Desk
- 2 Changing Racial Composition of Metropolitan Areas
- 10 AIDS: A Comparison of Knowledge and Attitudes Among Black, Hispanic and White Americans, 1990
Ann M. Hardy, Dr. P.H., Epidemiologist, Division of Health Interview Statistics, National Center for Health Statistics, and Ann E. Biddlecom, M.A., Dept. of Sociology, Brown University
- 18 Commentary: AIDS—A Need for Ongoing Education
Mervyn F. Silverman, M.D., M.P.H., President, The American Foundation for AIDS Research
- 19 Capsule Briefs
- 20 Selected Demographic and Health Characteristics—State Variations, 1988-1991
- 28 Use of Survey Data in a Corporatewide Health Promotion Program: The MetLife Experience
James M. Corry, Ph.D., Director, Corporate Wellness and Fitness Services, and Sharon L. Knauer, Manager, Managed Care Center, Metropolitan Life
- 36 Statistical Information, Please
- Back Cover: Historical Perspectives

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From the Editor's Desk

Cancer death rates are in the news (see "Capsule Briefs"). Among women, cancer is now the leading cause of death, and for the entire U.S. population, it has been predicted that by the year 2000 cancer will be the nation's leading cause of death, replacing heart disease.¹

Though cancer death rates have been used in the past to estimate risk, they have statistical limitations. Convenience has dictated their use because good national estimates of cancer incidence (new cases) were not available. Secular (time) trends in incidence rates for younger populations, however, are a preferable way to assess changes in population cancer risk than are death rates.²

New Federal Data on Lung Cancer

Useful annual estimates of cancer incidence, though, only became available nationally in 1973 when the National Cancer Institute started the Surveillance, Epidemiology and End Results (SEER) program.

Lung cancer is the nation's major tobacco-caused malignancy and also the leading cause of cancer death for both sexes. Its five-year survival rate is about 13 percent.

Now, based on 1973-87 data, SEER has good news about changes in lung cancer risk. Its estimates, which compared 1973-77 with 1983-87 incidence rates in younger white Americans aged 20-44, showed that rates declined for men (19 percent) and for women (nine percent). Hopefully, this favorable decline forecasts even better future news for total lung cancer deaths.

Rejoicing about this change, however, would be premature because more than 50 million smokers remain. Further sobering our hopes for rapid change in lung cancer incidence are the studies showing that smokers who quit tend to be at lower risk because they smoke less. Since remaining smokers are at higher risk, the total annual lung cancer deaths may only edge downward slowly from the 1989 level—about 136,000.

Staying the Smoke-Free Course

These cancer incidence data—together with the 25-year decline in heart disease and stroke death rates—are gratifying news for everyone whose past efforts have promoted public education for a smoke-free environment. Further, these findings should encourage present workers to stay their course.

Tobacco, however, remains Public Health Enemy No. 1 for all Americans. The SEER data on lung cancer risks for whites are reassuring about the past four decades of educational effort. But, one may also ask: Will those same strategies (for whites) yield comparable results for African-Americans, and perhaps for Hispanics and Asians? The question is not academic. For instance, when compared with whites, African-Americans' overall smoking prevalence is 25 percent higher. Their men's lung cancer death rates are 50 percent higher than among white men. Comparable estimates for Hispanics and Asians are not yet available.

When cancer risks in minority populations are established by SEER, culturally appropriate health education and smoking cessation programs can be better focused for risk reduction.³ Fortunately, the National Cancer Institute has already begun a limited number of programs to address minority needs in cancer prevention. Will they be sufficient? Perhaps an encouraging answer will come from future SEER reports. □

Charles B Arnold

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Changing Racial Composition of Metropolitan Areas

RECAP

Ethnic Increases

In the past decade, the number of Hispanics and Asians or Pacific Islanders residing in the largest metropolitan areas increased by a remarkable 60 percent and 127 percent, respectively. In April 1990, there were 4.9 million persons of Asian or Pacific Islander origin and 14.1 million of Hispanic background living in the 25 most populous urban centers; they constituted roughly two-thirds of the nation's total population of these ethnic groups. For the most part, the destinations of these newcomers were primarily the big metropolitan areas of the West and Southwest regions of the country, although the urban centers of the Northeast and North Central attracted large numbers. By contrast, in this period the number of blacks—the largest minority group—rose by only one-seventh. □

During the past decade there were dramatic changes in the ethnic composition of the United States population. For the country as a whole, the number of Asians or Pacific Islanders increased from 3.5 million in 1980 to 7.3 million in April 1990. Additionally, at the time of the last Decennial Census, there were 22.4 million persons of Hispanic origin residing in the country—up from 14.6 million 10 years earlier.¹ Combined, these two racial groups accounted for more than half of the nation's total population increase. It is noteworthy that the destinations of the vast majority of these immigrants were to the West and Southwest regions of the country, and especially to the larger urban areas.

Reflecting the tendency of migrants to flock to major cities, the country's population is becoming more concentrated.² Further evidence was provided by a recent analysis of the April 1990

The vast number of newcomers swelled the combined population of the 25 largest metropolitan areas to 107.5 million in April 1990.

census; the 25 most populous metropolitan statistical areas contained 43.2 percent of the total resident population in 1990 compared with 42.4 percent in 1980 (see box on page 5). These sprawling urban places can attribute their growth to the ongoing influx of persons from other states as well as those from outside the country.

Drawn by the availability of economic opportunities, the vast number of



David Johnson

Table 1—Population of the 25 Largest Metropolitan Statistical Areas United States, April 1, 1990

Metropolitan Area*	Total Population
United States	248,709,873
New York-Northern NJ-LI, NY-NJ-CT CMSA	18,087,251
Los Angeles-Anaheim-Riverside, CA CMSA	14,531,529
Chicago-Gary-Lake County, IL-IN-WI CMSA	8,065,633
San Francisco-Oakland-San Jose, CA CMSA	6,253,311
Philadelphia-Wilmington-Trenton, PA-NJ-DE-MD CMSA	5,899,345
Detroit-Ann Arbor, MI CMSA	4,665,236
Boston-Lawrence-Salem, MA-NH CMSA	4,171,643
Washington, DC-MD-VA MSA	3,923,574
Dallas-Fort Worth, TX CMSA	3,885,415
Houston-Galveston-Brazoria, TX CMSA	3,711,043
Miami-Fort Lauderdale, FL CMSA	3,192,582
Atlanta, GA MSA	2,833,511
Cleveland-Akron-Lorain, OH CMSA	2,759,823
Seattle-Tacoma, WA CMSA	2,559,164
San Diego, CA MSA	2,498,016
Minneapolis-St Paul, MN-WI MSA	2,464,124
St Louis, MO-IL MSA	2,444,099
Baltimore, MD MSA	2,382,172
Pittsburgh-Beaver Valley, PA CMSA	2,242,798
Phoenix, AZ MSA	2,122,101
Tampa-St Petersburg-Clearwater, FL MSA	2,067,959
Denver-Boulder, CO CMSA	1,848,319
Cincinnati-Hamilton, OH-KY-IN CMSA	1,744,124
Milwaukee-Racine, WI CMSA	1,607,183
Kansas City, MO-KS MSA	1,566,280
Total	107,526,235

* See box on page 5.

Source: Bureau of the Census, press release CB91-229.

newcomers swelled the combined population of the 25 largest metropolitan areas to 107.5 million in April 1990 (see Table 1). A breakdown of this total (see figure) reveals that 25 percent of the residents were persons other than whites—in 1980 this proportion was 21 percent. Among the nonwhite population the number of Americans of African ancestry constituted the largest ethnic group, although their relative number remained virtually unchanged from that in 1980—roughly 15 percent. On the other hand,

the past census counted 4.9 million persons of Asian or Pacific Islander origin in these large metropolitan centers—an increase of 127 percent in the decade. During this interval, the number of persons of Hispanic origin living in these locations rose from 8.8 million to 14.1 million. As a result of these patterns, in 1990 roughly two-thirds of all Asians or Pacific Islanders and persons of Hispanic origin resided in the 25 largest metropolitan areas. Specifically, the relative numbers were nearly 68 percent for Asians and Pacific Islanders and 63 percent for Hispanics.

In 1990 roughly two-thirds of all Asians or Pacific Islanders and persons of Hispanic origin resided in the 25 largest metropolitan areas.

Between 1980 and 1990, the population of the United States increased by 9.8 percent, while the relative growth in the giant metropolitan areas varied significantly. This is not surprising in view of the widely dispersed geographic location of the urban areas as well as their ethnic diversity. As can be ascertained from Table 2, which presents the racial composition of the 10 largest statistical areas, the relative changes in these places were substantial, but there is a huge disparity in their absolute size. The detailed analysis has been limited to the top 10 centers because, of all persons living in the 25 leading metropolitan areas, these centers encompassed 68 percent of the total population, 84 percent of the Asian and Pacific Islanders, and 81 percent of those with an Hispanic origin.

The New York CMSA

By far the most populous urban center was the New York-Consolidated metropolitan statistical area (CMSA) with 18.1 million residents. In this area, comprised of five distinct PMSAs, the number of inhabitants rose by just 3.1 percent between 1980 and 1990. In April 1990 the population of the nation's largest urban area was made up of 70 percent whites, 18 percent blacks, 5 percent Asians or Pacific Islanders and 7 percent of other races. Over 15 percent of all persons were from an Hispanic background—which crosses ethnic divisions. Analysis of the decennial changes revealed that, while there were about 5 percent fewer whites living in the area in 1990, the number of persons of all other races increased by 28 percent. Additionally, the data discloses that persons of Asian or Pacific Islander background rose by 136 percent in the period. For persons of Hispanic origin, the population gain was 35 percent.

In the New York primary metropolitan statistical area (PMSA), the second largest in the country, white persons barely constituted the majority of the population.

The five subdivisions of the New York CMSA experienced significantly different population changes. The Newark and Bergen-Passaic PMSAs recorded small population declines in the decade and there was virtually no gain in the Nassau-Suffolk area. On the other hand, the number of persons living in the Middlesex PMSA increased by 15 percent. It should be noted that the latter population center was the only PMSA in which the number of

whites increased. As a group, the number of persons of all other races living in this expanding metropolitan area nearly doubled in the past 10 years and, within this racial category, persons of Asian or Pacific Islander origin climbed by 264 percent. In this same time period, the count of persons of Hispanic origin increased by 83 percent. It must be pointed out that, although the relative gains for persons other than white were impressive, they were based on comparatively small numbers. In 1990 the Middlesex PMSA was still predominately inhabited by whites—they comprised 85 percent of the population.

In the New York PMSA, the second largest in the country, white persons barely constituted the majority of the population. In 1990, 56 percent of the area's residents were white, having declined from 64 percent in 1980. On the other hand, persons of all other racial backgrounds experienced gains. For instance, the number of blacks rose to 26 percent of the economic center's population. This relative number is larger than that in any other metropolitan area shown in the table, except the Washington MSA (27 percent). Between 1980 and 1990,

Definition of Metropolitan Statistical Areas

A metropolitan statistical area (MSA) is generally a county, or group of counties, surrounding a population nucleus of at least 50,000 and including communities closely integrated economically and socially with that nucleus. Metropolitan areas of at least 1,000,000 population may be subdivided into primary MSAs (PMSAs). If such PMSAs are recognized, the metropolitan area that includes them is designated a consolidated MSA (CMSA).

the number of Asians and Pacific Islanders residing in the New York PMSA rose by 121 percent and resulted in their total constituting 7 percent of the population—up from 3 percent in 1980. It should be mentioned that in each of the five PMSAs the Asian population increased by more than 100 percent.

The Los Angeles-Long Beach primary metropolitan statistical area (PMSA) dominates the three subdivisions of the giant West Coast consolidated metropolitan statistical area (CMSA).

The decennial population changes in the Los Angeles CMSA—the nation's other largest area—also exhibited substantial racial variations. Overall, the population in this CMSA rose very rapidly, namely, by 26 percent. This relative gain was more than two-and-one-half times the national rate and, among the leading metropolitan centers, was only exceeded by the percent gain in the Dallas-Fort Worth CMSA—33 percent. The Los Angeles CMSA contained more than 14.5 million persons in 1990, of which about two-thirds were whites. Fully one-third of the residents of this huge urban area were of Hispanic origin and about one-tenth were either Asians or Pacific Islanders. As a group, persons in the latter ethnic category increased by 138 percent between 1980 and 1990, while the relative rise was 73 percent for those of Hispanic origin.

The Los Angeles-Long Beach PMSA dominates the three subdivisions of the giant West Coast CMSA. This huge metropolitan area, with 8.9 million

residents, is about three-and-one-half times the size of the Riverside-San Bernardino PMSA. Size is not the only distinguishing characteristic between these two neighboring urban centers. As may be seen, their decennial growth patterns were widely divergent. For instance, total population increased by 19 percent in the Los Angeles-Long Beach area but was an outstanding 66 percent in the Riverside-San Bernardino PMSA. Analysis by racial group shows that in the Riverside PMSA the number of white residents rose by 51 percent, Asians or Pacific Islanders increased by a phenomenal 318 percent and persons of Hispanic origin climbed by 136 percent. By comparison, in the Los Angeles-Long Beach area the relative gains for persons of all other races and those of Hispanic origin were less than half that in Riverside. Among Asians or Pacific Islanders the population gain in the Los Angeles area was roughly one-third that in the Riverside PMSA and, among persons of African heritage, there was only a 5 percent increase in the Los Angeles area. Moreover, the recent census found fewer whites residing in the Los Angeles metropolitan area in 1990 than a decade earlier; this resulted in the relative number of whites in Los Angeles being virtually the same as in the New York PMSA.

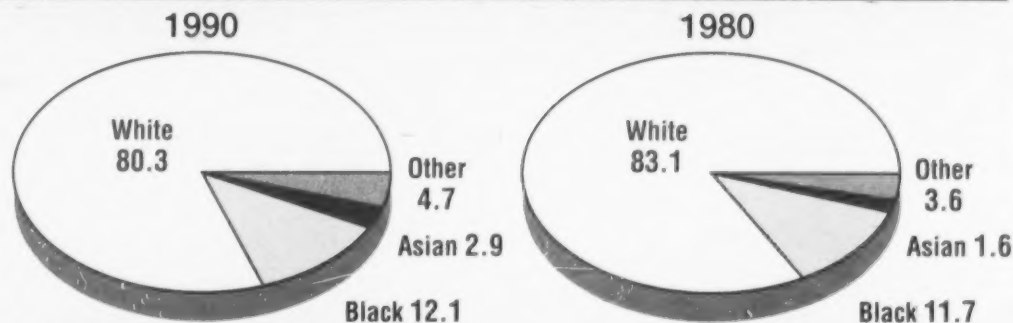
Growth Versus Decline for Nation's Other CMSAs

The decennial population changes for the remaining seven large statistical areas, for the most part, fall into two separate groups. The resident population of the Chicago CMSA—the third largest in the United States—as well as those of the Philadelphia and Boston CMSAs increased only slightly between 1980 and 1990, while the number of persons living in the Detroit CMSA actually declined. In the Detroit and Chicago areas and in the Boston PMSA, fewer white residents were counted living

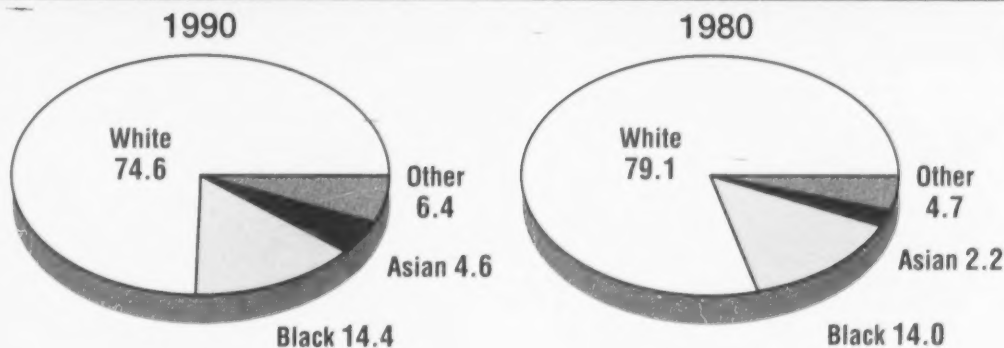
**Racial Distribution of the U. S. Resident Population
and 25 Largest Metropolitan Statistical Areas
April 1, 1980 and 1990**

Percent Distribution

United States



Top 25 CMSAs



Source: Same as Table 2.

within their geographic boundaries in 1990. However, in the latter area substantial decennial population gains were recorded among persons in each of the other ethnic categories.

Currently, the racial composition of the population in the Boston CMSA is markedly different from that in the three other CMSAs.

In 1990 nearly 90 percent of this area's inhabitants were white compared with about 75 percent for the others. Additionally, whereas about 6 percent of Boston's population were of African origin, 20 percent were from this background in the Chicago, Philadelphia and Detroit CMSAs. With regard to persons of Asian or

Table 2—Population of the 10 Largest Metropolitan Areas by Ethnic Group, United States, April 1, 1990

Metropolitan Area	Total Population	Percent Distribution						Percent Change April 1, 1980-90						
		Race					Hispanic Origin †	Race					Hispanic Origin †	
		White	All Other					Total	White	All Other				
			Total	Black	Asian*	Other				Total	Black	Asian*	Other	
United States	248,709,873	80.3	19.7	12.1	2.9	4.7	9.0	9.8	6.0	20.4	13.2	107.8	43.8	53.0
New York-Northern NJ-LI, NY-NJ-CT CMSA	18,087,251	70.2	29.8	18.2	4.0	6.8	15.4	3.1	-4.8	28.3	16.4	135.5	22.1	35.4
New York, NY PMSA	8,546,846	56.5	43.5	26.3	6.5	10.7	22.1	3.3	-9.5	26.5	18.0	121.4	16.7	29.0
Nassau-Suffolk, NY PMSA	2,609,212	88.4	11.6	7.4	2.4	1.8	6.3	0.1	-3.5	46.3	19.4	151.9	62.1	62.0
Newark, NJ PMSA	1,824,321	70.2	29.8	23.2	2.9	3.7	10.3	-2.9	-7.9	11.4	3.5	115.3	22.8	44.8
Bergen-Passaic, NJ PMSA	1,278,440	81.6	18.4	8.3	5.2	4.9	11.6	-1.1	-8.4	52.3	15.1	173.8	64.6	63.1
Middlesex-Somerset-Hunterdon, NJ PMSA	1,019,835	84.8	15.2	6.9	5.6	2.7	7.0	15.1	7.1	97.1	50.3	264.4	71.5	83.2
Los Angeles-Anaheim-Riverside, CA CMSA	14,531,529	64.6	35.4	8.5	9.2	17.7	32.9	26.4	11.1	68.8	16.1	138.3	80.5	73.4
Los Angeles-Long Beach, CA PMSA	8,863,164	56.8	43.2	11.2	10.8	21.2	37.8	18.5	-0.8	59.3	5.2	119.9	83.4	62.2
Riverside-San Bernardino, CA PMSA	2,588,793	74.6	25.4	6.9	3.9	14.6	26.5	66.1	50.5	138.7	126.9	317.5	119.2	136.4
Anaheim-Santa Ana, CA PMSA	2,410,556	78.6	21.4	1.8	10.3	9.3	23.4	24.7	13.5	95.7	68.8	186.8	48.0	97.3
Chicago-Gary-Lake County, IL-IN-WI CMSA	8,065,533	71.6	28.4	19.2	3.2	6.0	11.1	1.6	-1.9	11.8	-0.6	77.0	40.1	41.3
Chicago, IL PMSA	6,069,974	67.5	32.5	22.0	3.8	6.7	12.1	0.2	-4.3	10.9	-1.6	75.4	39.6	41.4
San Francisco-Oakland-San Jose, CA CMSA	6,253,311	69.3	30.7	8.6	14.8	7.3	15.5	16.5	6.7	46.8	14.8	103.9	18.3	47.0
Oakland, CA PMSA	2,082,914	65.9	34.1	14.6	12.9	6.6	13.1	18.2	7.7	46.0	15.2	131.5	28.7	47.0
San Francisco, CA PMSA	1,603,678	66.0	34.0	7.6	20.6	5.8	14.5	7.7	-0.1	26.9	-3.8	57.6	0.1	40.6
San Jose, CA PMSA	1,497,577	68.9	31.1	3.7	17.5	9.9	21.0	15.6	1.4	67.9	28.6	161.6	10.6	38.8
Philadelphia-Wilmington-Trenton, PA-NJ-DE-MD CMSA	5,899,345	77.0	23.0	18.6	2.1	2.3	3.8	3.9	1.1	14.2	6.5	131.7	30.4	52.7
Philadelphia, PA-NJ PMSA	4,856,881	76.5	23.5	19.1	2.2	2.2	3.6	3.0	0.4	12.5	5.1	130.5	26.2	49.6
Detroit-Ann Arbor, MI CMSA	4,665,236	76.5	23.5	20.9	1.5	1.1	1.9	-1.8	-4.4	7.7	5.9	77.3	-10.4	17.4
Detroit, MI PMSA	4,382,299	76.0	24.0	21.6	1.3	1.1	1.9	-2.4	-5.0	7.1	5.7	72.1	-10.1	16.1
Boston-Lawrence-Salem, MA-NH CMSA	4,171,643	88.9	11.1	5.7	2.9	2.5	4.6	5.0	0.5	65.2	35.6	183.9	67.5	108.9
Boston, MA PMSA	2,870,669	87.1	12.9	7.3	3.3	2.3	4.5	2.3	-2.3	49.9	28.2	153.0	43.3	89.6
Washington, DC-MD-VA MSA	3,923,574	65.7	34.3	26.5	5.2	2.6	5.7	20.7	14.9	33.7	19.7	143.9	91.2	136.7
Dallas-Fort Worth, TX CMSA	3,885,415	75.3	24.7	14.3	2.5	7.9	13.4	32.6	25.5	60.3	32.4	298.4	97.9	109.4
Dallas, TX PMSA	2,533,362	72.6	27.4	16.1	2.6	8.7	14.4	30.4	22.7	56.9	30.2	277.9	96.9	109.5
Fort Worth-Arlington, TX PMSA	1,332,053	80.3	19.7	10.8	2.3	6.6	11.3	36.9	30.6	70.1	39.0	352.7	100.5	109.1
Houston-Galveston-Brazoria, TX CMSA	3,711,043	67.6	32.4	17.9	3.6	10.9	20.8	19.7	11.1	42.9	17.8	149.0	81.0	72.2
Houston, TX PMSA	3,301,937	66.3	33.7	18.5	3.8	11.4	21.4	20.7	11.4	44.7	18.6	150.5	84.6	75.9
Total	73,193,980	71.1	28.9	15.3	5.6	8.0	15.6	10.9	3.0	36.2	13.0	126.6	53.1	58.8

* Includes Pacific Islanders.

† Persons of Hispanic origin may be of any race.

Source: Bureau of the Census, press release CB91-229 and unpublished data.

Pacific Islander heritage, only 2 percent to 3 percent of the residents in all four of the areas were from this ethnic origin. On the other hand, Hispanics comprised 11 percent of persons in the Chicago CMSA, while in the three other CMSAs this proportion was less than 5 percent.

The resident population of the Chicago CMSA as well as those of the Philadelphia and Boston CMSAs increased only slightly between 1980 and 1990, while the residents in the Detroit area declined

The West Coast's other large CMSA—San Francisco-Oakland-San Jose—is composed of three separate PMSAs. Examination of the relative changes in the racial composition of the population residing in these areas reveals significant disparities in the San Francisco center. The total population in this urban area increased by just 8 percent or roughly half that of the other two areas and, moreover, the absolute number of whites and blacks declined between 1980 and 1990. The higher overall decennial growth rate in the San Jose and Oakland areas can be attributed to the very rapid gains of Asians or Pacific Islanders.

Despite the differences in the decennial rate of racial change, in 1990 the subdivisions of the San Francisco CMSA have fairly similar ethnic distributions. Around two-thirds of the resident population in these urban areas were white and approximately one-seventh were of Asian or Pacific Islander origin. Moreover, the proportion that were Hispanic was almost the same

as were Asian. The only notable variance in the racial distributions in these three areas occurred among African-Americans; they comprised 4 percent of the total population of the San Jose PMSA but 15 percent of that in Oakland.

Approximately the same relative number of African-Americans resided in the Southwest's huge CMSAs—Dallas-Fort Worth and Houston-Galveston-Brazoria. In these metropolitan areas, the data show that this proportion was about the same for persons of Hispanic origin. Another similarity was that the number of Asians comprised a relatively small proportion of the residents. Among white persons, the percentage residing in the Dallas CMSA was somewhat larger than in the Houston area. It is noteworthy that Dallas's overall growth rate was three-and-one-third times that of the national rate, and Houston's relative population gain was twice the countrywide figure. Between 1980 and 1990 the percentage increases for each of the ethnic groups in the Dallas metropolitan area were higher than virtually all the other top 10 urban areas.

The outlook for continued growth in the large metropolitan areas is mixed. Although the picture seems brighter for the urban centers in the West and Southwest regions of the country, it would be premature to ignore the resurgence potential for those in the Northeast and North Central. In the past decade, the metropolitan areas which grew vibrantly attributed their gains, in large measure, to the influx of Hispanics and persons of Asian or Pacific Islander origin. Whether this phenomenon will be repeated in the 1990s is uncertain. □

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AIDS: A Comparison of Knowledge and Attitudes Among Black, Hispanic and White Americans, 1990

RECAP

AIDS: Knowledge and Attitudes

Increasing awareness about AIDS is an important step toward the prevention of this disease. The AIDS Knowledge and Attitudes Survey of the National Health Interview Survey shows that more than 80 percent of U.S. adults are familiar with the major modes of AIDS transmission. Despite this, up to one-third still believe that AIDS can be spread by various forms of casual contact. In the three racial/ethnic groups studied, the less educated were less knowledgeable. Further, black and Hispanic adults lagged somewhat behind white adults in certain important aspects of AIDS knowledge. About one-fourth of white, black and Hispanic adults have had the HIV antibody test. While reasons for testing differed, most of the adults were tested in health care sites. Educational counseling that should accompany HIV testing is provided to less than half of those tested. Identifying gaps in knowledge can help to more effectively target AIDS educational efforts. □

By the end of 1991, over 200,000 cases of AIDS had been reported to the Centers for Disease Control's national AIDS case surveillance registry.¹ In addition,

approximately one million persons in this country are estimated to be infected with the human immunodeficiency virus (HIV) that causes AIDS.² Much of the U.S. effort to control and prevent AIDS has focused on educating people on how to avoid becoming infected. For those at extremely low risk of acquiring HIV infection, accurate information can also prevent unnecessary fear.

To be successful, educational efforts must focus on the specific needs of various population groups. Two groups of particular interest in the United States are blacks and Hispanics, both of which have been disproportionately affected by AIDS. Blacks account for 12 percent of the U.S. population but make up 29 percent of the AIDS cases.

Hispanics comprise about 9 percent of the population and 16 percent of AIDS cases.¹ Within the Hispanic population, AIDS rates also differ by country of origin, with Puerto Ricans having higher rates of disease than Mexican-Americans.³ Data on the levels of knowledge about AIDS and HIV transmission in these racial/ethnic groups can be used to target educational programs more effectively. The National Health Interview Survey on AIDS Knowledge and Attitudes provides such data on a large, nationally representative sample of adults. Findings from the 1990 survey for black (nonHispanic), white (nonHispanic), and Hispanic adults are the focus of this report.^{4,5}

The National Health Interview Survey (NHIS)

The NHIS is an annual cross-sectional household survey of the U.S. civilian, noninstitutionalized population conducted

Table 1—Percent of Adults Who Thought Selected Statements About AIDS Were "Definitely True," by Race/Ethnicity and Years of Education

	Race/Ethnicity		
	White NonHispanic	Black NonHispanic	Hispanic
Percent responding definitely true			
Any person with the AIDS virus can pass it on to someone else through sexual intercourse			
Years of education:			
Less than 12 years	82	80	74
12 years	88	89	88
More than 12 years	90	92	88
A person can be infected with the AIDS virus and not have the disease AIDS			
Years of education:			
Less than 12 years	48	44	38
12 years	65	63	59
More than 12 years	79	73	71
There is no cure for AIDS at present			
Years of education:			
Less than 12 years	78	74	67
12 years	87	81	85
More than 12 years	92	87	87
AIDS is an infectious disease caused by a virus			
Years of education:			
Less than 12 years	54	57	56
12 years	68	75	70
More than 12 years	79	80	77

Source: National Center for Health Statistics; Division of Health Interview Statistics.
National Health Interview Survey, 1990.

by the Centers for Disease Control's National Center for Health Statistics. An AIDS knowledge and attitudes survey became part of the NHIS in 1987, and is administered to one randomly selected adult, 18 years and older, in each family included in the NHIS. In 1990 the AIDS questions were asked of 40,513 adults—2,501 Hispanics, 5,293 blacks (nonHispanic) and 30,996 whites (nonHispanic). The Hispanic sample is further subdivided by origin—1,375 Mexican, 326 Puerto Rican,* and 789 "other

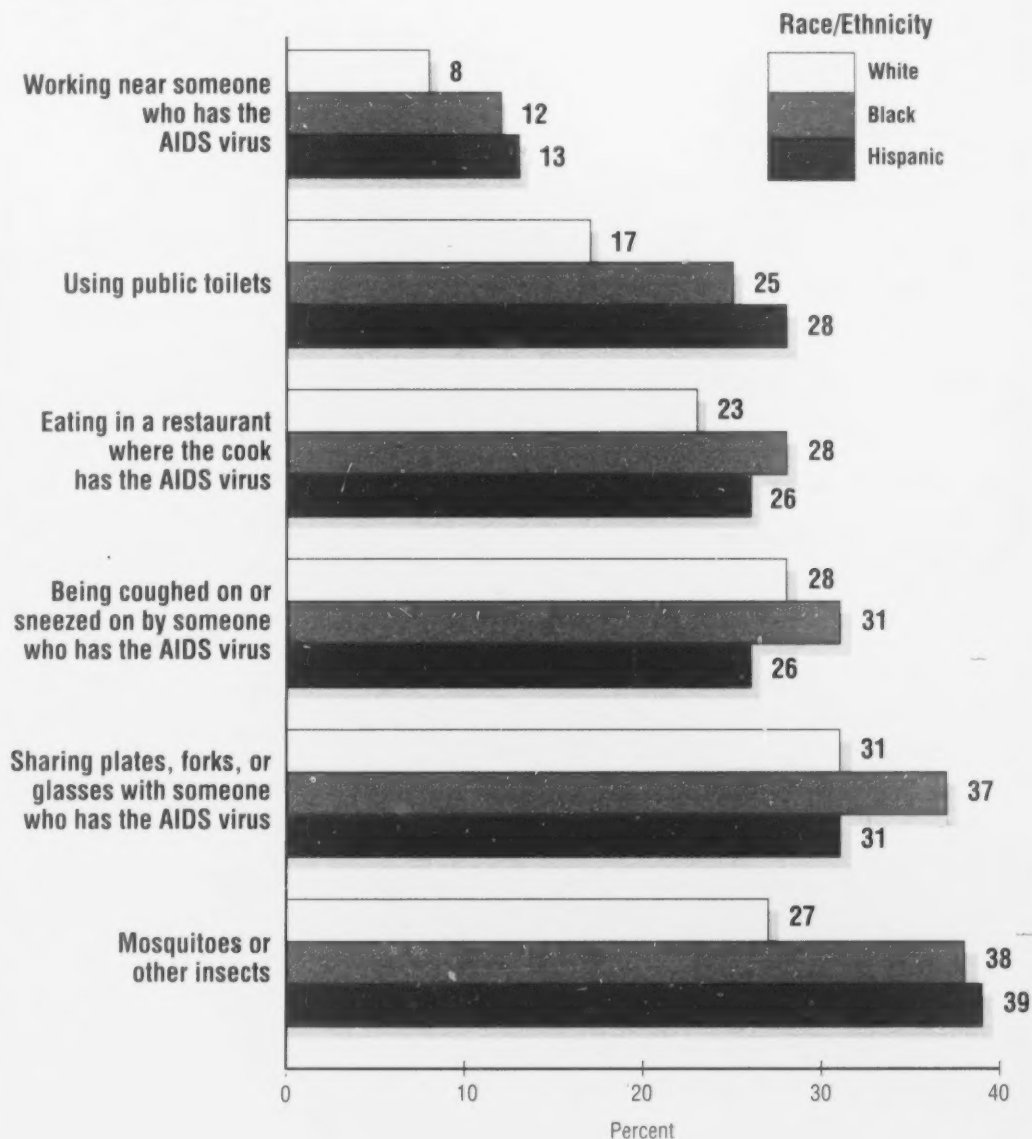
*Because the NHIS is not conducted in U.S. territories, the Puerto Rican subgroup includes only Puerto Rican adults residing in the United States.

Hispanic." For respondents speaking only Spanish, interviews were conducted by bilingual interviewers or another household member. Racial/ethnic classification was based on the respondent's self-assessed racial group and ethnicity. Because the NHIS sample is nationally representative, information obtained in the survey is weighted to provide national estimates.

Sources of Information and Communication About AIDS

Exposure to AIDS information was quite common in all three racial/ethnic groups. Between 88-89 percent reported receiving information about AIDS in the month prior

**Figure A—Misperceptions About AIDS Transmission:
Percent Who Thought It Very or Somewhat Likely
to Become Infected in Selected Ways
by Race/Ethnicity, 1990**



Source: National Center for Health Statistics; Division of Health Interview Statistics, National Health Interview Survey, 1990.

AIDS: A Comparison of Knowledge and Attitudes Among Black, Hispanic and White Americans, 1990

to the interview with television cited as the most frequent source for all groups (77-78 percent). Newspapers, magazines and radio followed as frequent sources of AIDS information.

Television was the most frequently mentioned source of AIDS information for all three racial/ethnic groups.

Approximately two-thirds (69 percent) of black and white parents of children aged 10-to-17 reported ever having discussed AIDS with them. For Hispanic parents, the proportion dropped to 57 percent, primarily because of the lower percentage of Mexican parents who reported such discussions (50 percent).

General Knowledge About AIDS

The proportion of persons who correctly answered questions about the three major modes of AIDS transmission (sexual intercourse, perinatal contact, and shared needles for drug use) was high (more than two-thirds) in all groups, even among those with less than a high school education. Differences were noted by race/ethnicity for the other facts about AIDS. However, within all three racial/ethnic groups, differences by years of education were more striking—greater knowledge was noted in those with more years of education (Table 1). Within the Hispanic group, Mexican-Americans had somewhat lower levels of knowledge than respondents of Puerto Rican origin.

Of particular importance were differences among the groups in awareness of the term "HIV" for the AIDS virus. Such knowledge was fairly high among both white and black adults (76 and 70 percent, respectively), but the term was recognized

by only 50 percent of Hispanic persons. White adults were more likely to be aware that a person can be infected with the AIDS virus and not have the disease, AIDS; 68 percent of whites responded "definitely true" compared to 60 percent of black and 52 percent of Hispanic adults. Less than half of those in all three racial/ethnic groups knew that drugs are available to treat AIDS virus infection that can lengthen an infected person's life.

Misperceptions About HIV Transmission

Despite the generally high levels of awareness of the major modes of HIV transmission, misperceptions about transmission through casual contact persisted, with racial/ethnic differences consistent on most questions about transmission (Figure A). As with general knowledge, years of education also had

Within the three racial/ethnic groups, AIDS knowledge was greater among those with more years of education.

a strong influence, and misperceptions decreased with increasing years of education. However, racial/ethnic differences remained, even among the most educated. For example, 19 and 20 percent, respectively, of Hispanic and black adults with more than 12 years of education thought it was "very" or "somewhat" likely to become infected with HIV from public toilets compared with 12 percent of comparably educated white adults. In contrast to general knowledge levels, fewer differences existed in the proportion of Hispanics of Mexican origin versus Puerto Rican origin with misperceptions about transmission.

Table 2—Percent of Adults Who Reported Various Reasons for HIV Antibody Testing,* by Race/Ethnicity

Reason	Race/Ethnicity		
	White NonHispanic	Black NonHispanic	Hispanic
Voluntary	43	51	37
Required for:			
Hospitalization or Surgery	12	10	5
Life Insurance	10	3	1
Health Insurance	4	1	1
Military	11	11	2
Employment	7	9	6
Immigration	1	2	39
Other	13	14	10

* Excludes testing done as part of blood donation process.
Source: Same as Table 1.

The forms of contact perceived as the most threatening by all groups were those that involved potential exchange of saliva or blood (Figure A). Approximately one-third of adults in each of the racial/ethnic groups felt it was at least "somewhat" likely to transmit AIDS by sharing plates, forks or glasses with an infected individual. Being coughed or sneezed on by someone with the AIDS virus was viewed as "somewhat" or "very" likely to transmit HIV by approximately one-fourth of adults.

Awareness of Prevention Methods

White adults were more likely than either blacks or Hispanics to rate condoms as at least "somewhat" effective in preventing AIDS transmission (81 percent compared with 72 and 71 percent). The two minority groups were also more uncertain about the effectiveness of this method than were white adults. Within the Hispanic population, Puerto Rican adults were more likely than Mexican-Americans to view condoms as effective (80 percent compared with 67 percent).

HIV antibody testing has long been a major component of the U.S. AIDS prevention program.⁶ However, awareness of the test

AIDS: A Comparison of Knowledge and Attitudes Among Black, Hispanic and White Americans, 1990

was much lower among black and Hispanic than white adults. Approximately one-third of black and Hispanic adults had not heard of the blood test compared with 19 percent of white adults. The proportion who had heard of the test also increased with education, but was lower among those 50 years of age and older.

Awareness of the HIV antibody test was lower among black and Hispanic adults than white adults.

Slightly more than half of all black and Hispanic adults knew that blood donations are routinely tested for HIV infection, compared with 71 percent of white adults. Some of this difference is due to the lower proportion of black and Hispanic adults who knew of the AIDS antibody test. However, even among those adults aware of the test, blacks and Hispanics were still somewhat less aware than whites that donations are tested.

HIV Antibody Testing

The NHIS estimates that about one-fourth of adults in all race/ethnic groups have been tested for HIV antibodies through various means. Among white adults, most were tested as part of blood donation, while among black and Hispanic adults, testing for other reasons accounted for a higher proportion of the total tested. This racial/ethnic difference is more striking when one considers that fewer blacks and Hispanics were aware of HIV testing. Excluding testing done as part of the blood donation process, 21 and 23 percent of black and Hispanic adults aware of the test have been tested, compared with 11 percent of knowledgeable white adults.

Table 3—Percent of Adults Tested for HIV Disease Who Received Pre- and Posttest Counseling, Received Test Results, and Felt Their Results Were Handled Confidentially, by Race/Ethnicity

	Race/Ethnicity		
	White NonHispanic	Black NonHispanic	Hispanic
Received Pretest Counseling	38	52	39
Received HIV Test Results	75	80	83
Received Posttest Counseling*	24	43	35
Felt Results Were Handled Confidentially	91	92	91

* Of those who received results.

Source: Same as Table 1.

Examining the circumstances of HIV testing (excluding blood donation) also reveals some interesting racial/ethnic differences (Table 2). White and Hispanic adults were more likely to indicate their testing was required while black persons were more likely to seek testing voluntarily. The higher proportion of required testing in Hispanics was largely due to the high proportion of required testing in Mexican adults. Reasons for required testing were

Misperceptions about AIDS transmission decreased as years of education increased.

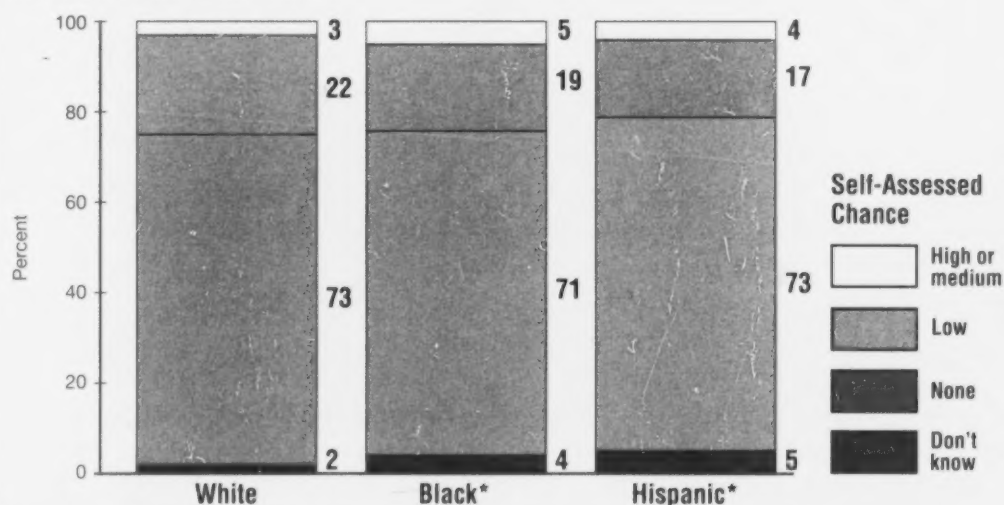
also examined and again differences emerged (Table 2). Of those tested, white adults were more likely than either black or Hispanic to report being tested for life insurance or health insurance (10 and 4 percent, respectively). Testing as a requirement of the military was more common among white and black adults

who were tested than among Hispanic adults. For Hispanics, the most commonly cited reason for required testing was immigration (mentioned by 39 percent of all Hispanics tested). For Mexican Americans, immigration accounted for over half (55 percent) of all HIV testing, exclusive of blood donation.

Despite the differences in the reasons for testing, the two most commonly reported places for the last antibody test by all three groups were doctor's office or HMO (28-45 percent) and hospital, emergency room or outpatient clinic (13-26 percent). For tested black and Hispanic adults, public health departments were the third most commonly reported site, while for whites it was a military induction site.

One of the values of HIV antibody testing in terms of prevention is the educational opportunity it provides through pre- and posttest counseling. However, according to NHIS data, a large proportion of individuals tested never receive any counseling (Table 3). Pretest counseling was reportedly received by 52 percent of blacks, 39 percent of Hispanics and 38 percent of whites who sought

Figure B—Self-Assessed Chance of Getting the AIDS Virus by Race/Ethnicity, 1990



* 1% indicated high chance of already having the AIDS virus.
Source: Same as Figure A.

testing. While three-fourths or more of those who were tested received their results, a much smaller proportion got posttest counseling. Over 90 percent of those tested in all three groups felt that their results were handled properly in terms of confidentiality.

Risk of HIV Infection

Respondents were also asked if they belonged to any of six listed behavior categories associated with increased risk for HIV infection (men having sex with other men, persons taking illegal drugs by needle). Two percent each of white and Hispanic adults and 3 percent of black adults reported being in any of these categories.

In terms of self-assessed chances of getting HIV infection, most (73 percent of white and Hispanic adults and 71 percent of black) indicated they had "no chance" of getting HIV and only 3-5 percent said their chances were "high" or "medium" (Figure B). Within the Hispanic population, the self-

assessed chances of getting HIV infection were similar for adults of Mexican and Puerto Rican origins.

The National Health Interview Survey estimated that about one-quarter of adults in each of the three racial/ethnic groups have been tested for HIV antibodies.

Summary

Education continues to be a crucial part of the public health response to the HIV/AIDS epidemic. Information on levels of knowledge in various population groups, such as that provided by the NHIS, will help to more effectively target educational efforts. From the NHIS data, U.S. adults appear fairly knowledgeable about AIDS.

**AIDS: A Comparison of Knowledge and Attitudes
Among Black, Hispanic and White Americans, 1990**

In particular, the three major modes of transmission appear to be recognized by a majority of persons in all sociodemographic groups. How this knowledge relates to behavior is unclear but most behavioral change models stress the need for accurate knowledge before appropriate change can take place.

Black persons were more likely than white or Hispanic to seek HIV antibody testing voluntarily.

Awareness of other aspects of AIDS still needs improvement, particularly in certain population groups. In all racial/ethnic groups, those with less than a high school education showed much lower levels of knowledge about AIDS. We must continue to develop educational programs that will be readily understood by this less educated portion of society. In addition to differences by educational level, black and Hispanic adults lagged somewhat behind the white population in certain aspects of AIDS knowledge and were more likely to have misperceptions regarding the risk of HIV transmission through casual contact. Because black and Hispanic persons are at increased risk of acquiring HIV infection, efforts must continue to reach these communities with materials that are effective, yet culturally sensitive and appropriate.

Approximately one-fourth of white, black, and Hispanic adults have been tested for HIV. Again, awareness of the test was lower in the two minority populations compared with the white majority population. Increasing awareness of the HIV test may help efforts to increase testing in these populations.

Our data on the counseling that should accompany HIV testing indicate that in

many instances, it is not being done. This represents missed opportunities to educate persons presenting for testing. For all groups, much of the HIV testing is performed in health care settings (doctors' offices or outpatient clinics). Thus, we must encourage primary health care providers to give information to all their tested patients, regardless of reasons for wanting the test, the results or the apparent low risk for HIV infection. □

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AIDS: A Need for Ongoing Education

In the time it takes to read this *Statistical Bulletin*, at least one person will be diagnosed with AIDS, and over the next 24 hours more than 135 more will be given this tragic news. In January, diagnosed cases reached 200,000. The first 100,000 occurred over the first eight years and the second 100,000 in the last two years.

We hope Ann Hardy's findings—that 88 percent of the people questioned had received information about AIDS in the month before study—would have an impact on this growing epidemic. Unfortunately, there is a great difference between knowledge and behavior change. For some, the information has not been fully understood as evidenced by the high rate of misperceptions—up to one-third believing casual contact to be a risk. Racial differences regarding knowledge also raise concerns about reducing the spread of HIV, since blacks and Hispanics have a disproportionate and growing share of HIV-infected individuals relative to their percentage of the U.S. population.

However, even among those clearly aware of the major modes of spread—unprotected sex and sharing injection equipment—there is still a great deal of denial. The percentage of knowledgeable individuals still engaging in unsafe behaviors is frightening. In San Francisco, where behavior change in some groups has been remarkable, recent studies show up to 20 percent relapsing into unsafe sexual practices.

We must, therefore, provide education that is ongoing, long-term, and culturally and linguistically sensitive to those at greatest risk for HIV infection.

We must not worry about offending the community at large. The only community we should *never* offend is the one we are trying to influence. Also, we cannot allow moralistic arguments to prevent us from reaching the youth of America. There is nothing more immoral than allowing our youth to die out of ignorance.

Government (federal, state and local), industry, the religious community, schools and civic clubs have to take part in this effort not only to prevent the spread of the human immunodeficiency virus but to prevent the other epidemics associated with AIDS—ignorance, apathy and bigotry. With a vaccine at least a decade away, the only vaccination we have is education.

Another aspect of AIDS that must be confronted is drug abuse. Until we deal with America's drug abuse problem we will never be able to control the AIDS epidemic. Most Americans ignored the drug problem until it became a crisis in our cities. Unfortunately, the major governmental response has been to increase law enforcement (with little effect) and to build more prisons. To be successful we must deal with the underlying causes of drug use. We must begin to deal humanely with those who are addicted and cease treating them as a disposable segment of society. Since 80 percent of these individuals do not have access to treatment, comprehensive drug treatment on demand must be made available across America and, while this is being planned and implemented, needle using addicts must have access to clean "works." To do

anything less condemns tens of thousands of addicts, their sexual partners and offspring to an untimely death.

Finally, with more than 1.5 million cases of AIDS in over 160 countries, and 8 to 10 million infected individuals worldwide, it is painfully evident that HIV/AIDS is a global problem requiring global solutions. Travel restrictions for those infected will have little or no impact on this growing pandemic. What will contribute to change are greatly increased funds and professional resources for the developing world, the equitable dissemination of life-prolonging drugs and vaccines when available, and a worldwide commitment to eliminate discrimination based on one's HIV status.

As we watch the numbers grow, it is clear that AIDS and its effects will outlive us all. We need a dynamic AIDS policy that is above politics—one that boldly addresses the problems. Access to quality care, adequate financing, elimination of discrimination, sensitivity to the needs of women and minorities, effective education, availability of drug treatment, fully funded research, affordable and available drugs for treatment and prevention—these issues must be dealt with *now*.

Mervyn F. Silverman, M.D., M.P.H.
President
The American Foundation
for AIDS Research

Capsule Briefs

are timely selections with broad reader interest

Cancer Risk and Prevention Update

By the year 2000, cancer is expected to become the leading cause of death in the United States. Cancer death rates have increased 6 percent from 1950-1987, while the mortality for heart disease decreased 55 percent in the same period.

(Henderson *et al*)

At the same time, more and better information about cancer risks has emerged since the initiation of the Surveillance, Epidemiology, and End Results (SEER) studies by the National Cancer Institute in 1973. SEER involves 11 cancer geographic areas in five states (Connecticut, Hawaii, Iowa, New Mexico, and Utah), five metropolitan areas (Atlanta, Detroit, New Orleans, Seattle/Puget Sound, and San Francisco) plus the Commonwealth of Puerto Rico. These 11 serve as registration districts for newly diagnosed cancer cases as well as for cancer deaths. The combined findings from SEER areas provide the United States with estimates on new cancer case (incidence) rates not previously available on such a scale. (See also "From the Editor's Desk.") (National Cancer Institute)

Cancer incidence rates can be grouped for analysis purposes according to their major risk (causal) factors. For instance, in this study cancer risks were categorized as: related to tobacco, possibly related to fat, and to other factors. This study,

using SEER analyses, for the first time compared 1973-77 and 1983-87 incidence rates in children and in adults under age 54. To increase comparability within the analysis, the study was limited to whites. In adults aged 20 to 44 years "the increase [of cancer] in both sexes can be wholly accounted for by the increase in [only] ...four types ...testis, melanoma, non-Hodgkin's lymphoma, and skin non-melanoma." The latter type had the biggest increase; it includes Kaposi's Sarcoma, a complication of AIDS. The second highest was non-Hodgkin's lymphoma. The other two (testis and melanoma) have been increasing for four decades; the risks for testis cancer remain a mystery. (Doll)

There were adverse changes in the incidence of four childhood and adolescent cancers: brain and central nervous system, lymphoma, leukemia, and other cancers. While there were sharply *decreased death rates* for childhood leukemia in recent years, the *increased incidence* was unexpected and not satisfactorily explained; there has not been a comparable change in incidence in the United Kingdom, for instance. (Doll)

The risk of melanoma is directly related to cumulative, lifetime sun-exposure by fair-skinned people. [The rate has been increasing for four decades

since it was first reported in the United States—Ed]. Excessive sun-tanning or burning greatly increases the risk. Women who wear bikinis have slightly increased risk of melanoma of the body trunk compared to those who wear one-piece bathing suits. (Weinstock *et al*)

Health education about these preventable cancer risks is, of course, essential to the nation's health. There are barriers, however, in that process. For instance, over a 25-year period, magazines that depend on tobacco revenues were not significantly *likely* to publish articles about tobacco's health risks.

(Warner *et al*) □

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Selected Demographic and Health Characteristics—State Variations, 1988-1991

RECAP

Selected Demographic and Health Characteristics by State

There is considerable regional variation in the distribution of persons over age 65, living on Social Security, living below the poverty level and with no health insurance. For the most part, such differences are reflected in low per capita income, low health care spending as well as less favorable health outcomes and health system utilization. These differences and disparities underscore the importance of considering a wide range of variables when drawing conclusions about the nation's health care system and when making policy decisions on various social programs. □

As the United States faces increasingly difficult economic conditions, there is mounting political pressure to re-evaluate the viability of many long-standing social and health programs. Nationwide, increased efficiency is sought in the delivery of essential services, including those associated with medicine and health. Medical care economics are particularly thorny because of the continued aging of the population and the unabated rate of escalation of medical costs. It is not surprising, therefore, that health care cost-containment efforts abound at this time in the nation.

An estimated \$666.2 billion was spent on health care in 1990 across the country; the third year of a double-digit increase in such costs.¹ Further estimates are for health care expenditures to double over the next 10 years, possibly increasing to more than 16 percent of the gross national product by the year 2000.^{1,2} As the economy dictates, decisions to curtail and/or discontinue various programs, services and activities are being debated and increasingly implemented.

Thus, now more than ever, the importance of having comprehensive data and an understanding of the complexities of the issues are being recognized. Only when a large amount of diverse data are available can the interrelationship of various demographic, lifestyle, socio-economic and situational variables be investigated. By looking at such data by component parts, as well as in the aggregate, a broader perspective of the problem emerges. This, in turn, helps investigators and policymakers gain a better handle on the issues in order to devise equitable solutions to difficult problems.³

Toward such a goal, the Public Policy Institute of the American Association of

**Table 1—Regional Differences in Selected Socioeconomic Characteristics
United States, 1988, 1989 and 1990**

Geographic Area	Percent in 1989			1988 Per Capita Income	1990 Per Capita Personal Health Expenditures	1988 Percent with No Health Insurance
	65 and Over	On Social Security	Below Poverty Level			
United States	12.5	15.4	12.89	\$16,489	\$2,425	14.1
New England						
Connecticut	13.6	16.0	2.87	\$23,059	\$2,699	9.2
Maine	13.4	17.3	10.37	\$15,106	\$2,175	10.3
Massachusetts	13.8	16.2	9.06	\$20,816	\$3,031	8.8
New Hampshire	11.4	14.3	7.78	\$19,434	\$1,981	11.7
Rhode Island	14.8	17.9	6.82	\$16,892	\$2,707	7.7
Vermont	12.0	15.2	7.99	\$15,302	\$1,956	11.4
Middle Atlantic						
New Jersey	13.2	15.7	8.26	\$21,994	\$2,224	9.7
New York	13.0	15.6	12.63	\$19,305	\$2,818	11.2
Pennsylvania	15.1	18.4	10.44	\$16,233	\$2,536	8.6
East North Central						
Illinois	12.3	14.9	12.78	\$17,575	\$2,619	10.8
Indiana	12.4	16.1	13.73	\$14,924	\$2,201	11.2
Michigan	11.9	15.8	13.22	\$16,552	\$2,569	8.0
Ohio	12.8	16.3	10.71	\$15,536	\$2,493	9.1
Wisconsin	13.4	17.0	8.52	\$15,524	\$2,449	8.9
West North Central						
Iowa	15.1	18.3	10.37	\$14,662	\$2,351	7.8
Kansas	13.7	16.1	10.76	\$15,759	\$2,548	9.7
Minnesota	12.6	15.2	11.22	\$16,674	\$2,480	10.3
Missouri	13.9	17.0	12.67	\$15,452	\$2,568	12.0
Nebraska	13.9	16.5	12.75	\$14,774	\$2,452	10.9
North Dakota	13.9	16.9	12.25	\$12,833	\$2,661	9.6
South Dakota	14.4	17.7	13.26	\$12,755	\$2,322	14.1
South Atlantic						
Delaware	11.7	15.2	10.15	\$17,661	\$2,268	9.7
District of Columbia	12.6	12.9	17.98	\$21,389	\$2,586	18.0
Florida	18.0	20.3	12.47	\$16,603	\$2,427	18.9
Georgia	10.2	13.4	15.04	\$15,260	\$2,072	16.9
Maryland	10.8	12.8	9.00	\$19,487	\$2,436	9.6
North Carolina	12.1	15.9	12.30	\$14,304	\$1,833	13.4
South Carolina	11.1	15.0	17.05	\$12,926	\$1,689	13.2
Virginia	10.8	13.4	10.90	\$17,675	\$2,076	12.7
West Virginia	14.7	19.8	15.83	\$11,735	\$2,088	14.1
East South Central						
Alabama	12.7	16.9	19.12	\$12,851	\$2,286	17.4
Kentucky	12.7	17.1	16.11	\$12,822	\$1,875	16.0
Mississippi	12.4	17.0	22.00	\$11,116	\$1,751	20.0
Tennessee	12.7	16.4	18.43	\$13,873	\$2,262	13.9
West South Central						
Arkansas	14.8	19.2	18.31	\$12,219	\$1,944	19.8
Louisiana	11.1	14.6	23.35	\$12,292	\$2,185	23.9
Oklahoma	13.3	16.3	14.78	\$13,323	\$2,139	20.6
Texas	10.1	12.6	17.18	\$14,586	\$2,192	24.4
Mountain						
Arizona	13.1	16.0	14.13	\$14,970	\$2,211	19.1
Colorado	9.8	12.3	12.12	\$16,463	\$2,415	13.3
Idaho	11.9	15.2	12.51	\$12,665	\$1,726	16.1
Montana	13.2	16.8	15.77	\$12,866	\$2,059	15.5
Nevada	10.9	14.0	10.82	\$17,511	\$2,757	21.3
New Mexico	10.5	13.9	19.62	\$12,488	\$1,792	24.5
Utah	8.6	10.9	8.25	\$12,193	\$1,784	12.3
Wyoming	9.7	12.6	10.90	\$13,609	\$1,756	14.5
Pacific						
Alaska	4.2	6.0	10.60	\$19,079	\$2,367	18.8
California	10.6	12.4	12.99	\$18,753	\$2,894	18.4
Hawaii	10.7	13.1	11.40	\$16,753	\$2,469	10.7
Oregon	13.9	17.1	11.21	\$14,885	\$2,312	15.6
Washington	11.9	14.7	9.63	\$16,473	\$2,311	11.3

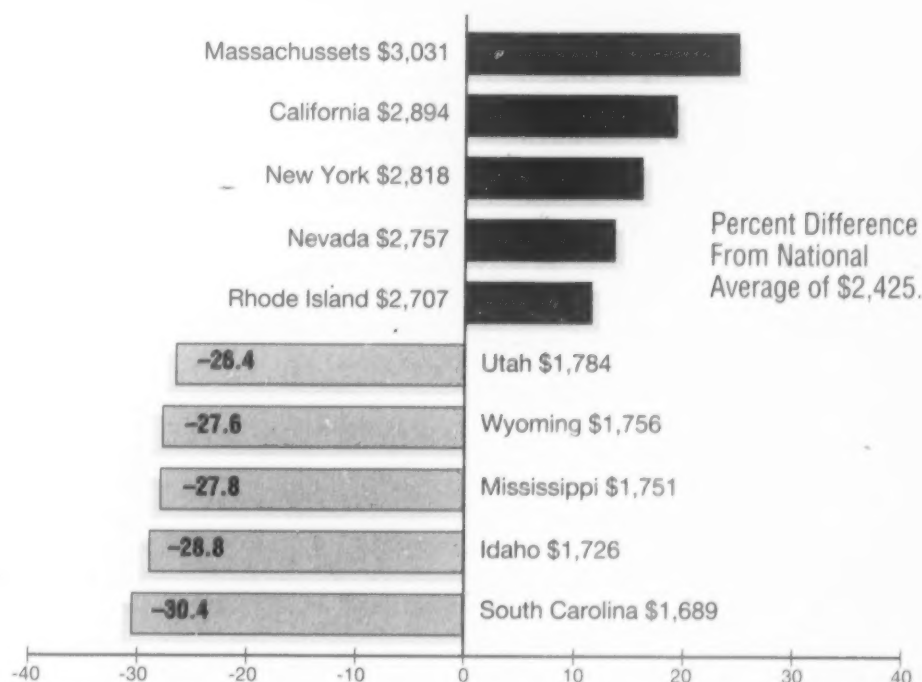
Source: American Association of Retired Persons, *Reforming the Health Care System: State Profiles, 1990*.

**Selected Demographic and Health
Characteristics—State Variations, 1988-1991**

Retired Persons (AARP) compiles and publishes a wide variety of demographic and health-related data on a state-by-state basis.² The ...1990 *State Profiles* compilation is part of the Institute's commitment to foster research on, and analysis of, policy issues of interest to America's older populations. The data are derived from numerous U.S. government agencies as well as national medical/health

professional organizations, insurance and research groups. These data describe the major health characteristics of, and selected actions taken by, each state to solve some of its health care problems. The primary intent of publishing such data is to aid the public and policymakers arrive at informed conclusions and/or decisions about economic and health care issues. While it is recognized that the "federal and

**Figure A—States with Five Highest and Five Lowest
Per Capita Personal Health Expenditures, 1990**



Source of basic data: Table 1.

**Table 2—State Rates and Ranking in Selected Health Status Indicators
United States, 1986 - 1991**

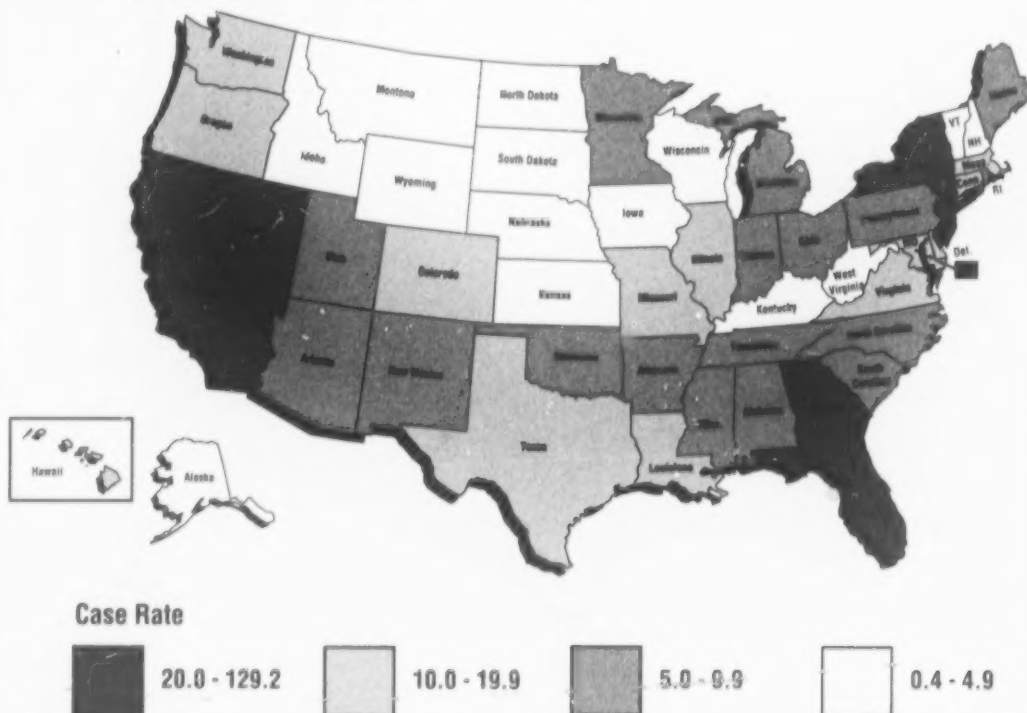
Area	Infant Deaths per 1,000* 1986-88		Percent of Births of Low Birth Weight 1989		Total Deaths per 100,000 1989		AIDS Cases per 100,000 1991	
	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
United States	10.1		7.0		866.3		17.4	
New England								
Connecticut	8.9	39	6.9	27	872.0	26	16.8	12
Maine	8.3	50	4.9	50	915.3	18	5.2	37
Massachusetts	7.9	51	5.9	36	911.9	19	16.6	13
New Hampshire	8.4	49	5.1	47	765.3	41	4.3	40
Rhode Island	8.6	45	5.2	33	957.6	8	9.1	23
Vermont	8.4	48	5.5	43	808.8	36	4.2	41
Middle Atlantic								
New Jersey	9.7	26	7.3	18	923.7	14	29.5	4
New York	10.7	16	7.7	12	956.4	10	44.5	2
Pennsylvania	10.2	21	7.1	21	1,027.5	4	9.5	21
East North Central								
Illinois	11.7	7	7.7	14	886.7	22	13.6	14
Indiana	10.8	15	6.6	30	877.8	24	5.9	34
Michigan	11.0	13	7.6	15	850.4	30	6.4	33
Ohio	9.9	24	7.0	24	901.9	20	5.6	35
Wisconsin	8.8	41	5.8	38	870.2	27	4.3	39
West North Central								
Iowa	8.7	43	5.4	44	957.6	9	3.4	46
Kansas	8.8	42	6.1	34	886.9	21	4.1	43
Minnesota	8.6	44	4.9	51	788.1	38	5.2	36
Missouri	10.3	20	6.9	28	977.4	6	12.8	16
Nebraska	9.2	37	5.8	37	918.7	16	3.7	45
North Dakota	9.2	34	5.0	48	834.8	33	0.6	50
South Dakota	11.1	12	5.4	45	915.9	17	0.4	51
South Atlantic								
Delaware	11.7	8	7.5	16	868.2	28	11.7	17
District of Columbia	21.2	1	15.9	1	1,266.4	1	129.2	1
Florida	10.7	17	7.7	13	1,047.8	3	40.3	3
Georgia	12.6	4	8.4	5	812.0	35	21.0	6
Maryland	11.5	10	8.0	10	817.1	34	19.3	9
North Carolina	12.0	6	8.1	9	874.7	25	7.3	27
South Carolina	12.7	3	9.2	3	843.3	31	9.3	22
Virginia	10.5	18	7.1	20	773.6	40	11.1	19
West Virginia	9.7	25	6.6	29	1,053.2	2	3.0	48
East South Central								
Alabama	12.5	5	8.3	7	947.2	12	8.6	24
Kentucky	10.1	23	6.9	26	949.8	11	4.7	38
Mississippi	12.8	2	9.4	2	968.6	7	7.8	26
Tennessee	11.1	11	8.2	8	920.1	15	7.0	31
West South Central								
Arkansas	10.4	19	8.3	6	1,024.4	5	8.3	25
Louisiana	11.6	9	9.1	4	859.5	29	17.2	11
Oklahoma	9.7	28	6.5	31	924.8	13	6.8	32
Texas	9.2	36	7.0	23	735.0	45	19.6	8
Mountain								
Arizona	9.5	31	6.3	32	793.4	37	7.1	30
Colorado	9.3	33	7.8	11	637.4	48	13.1	15
Idaho	10.2	22	5.5	42	736.5	44	2.9	49
Montana	9.4	32	5.5	41	838.1	32	3.9	44
Nevada	9.0	38	7.2	19	778.5	39	20.5	7
New Mexico	9.2	35	7.0	25	691.9	46	7.2	28
Utah	8.5	47	5.7	39	541.2	50	7.1	29
Wyoming	9.7	26	7.3	17	685.1	47	4.2	42
Pacific								
Alaska	10.9	14	4.9	49	397.5	51	3.4	47
California	8.8	40	6.1	35	745.3	43	26.3	5
Hawaii	8.5	46	7.1	22	584.7	49	18.5	10
Oregon	9.5	29	5.2	46	883.6	23	10.2	20
Washington	9.5	30	5.6	40	759.6	42	11.4	18

* Live births.

Source: National Center for Health Statistics, *Health, United States, 1990* and various Advance Data reports from CDC. Computations by Health and Safety Education personnel, Metropolitan Life Insurance Company.

WEEKLY REPORT APRIL 1992

**Figure B—Regional Differences in AIDS Rates per 100,000 Population
United States, December 1990 - November 1991**



Source: Table 2.

state governments have the ultimate responsibility to reform the [health care] system," the data are presented as a "working resource" to all interested in health and health care reform.²

Metropolitan Life Study

In order to analyze the diversity of health issues across the country, MetLife statisticians reviewed the AARP Institute's state profile data. When other data were

available, the compiled state statistics were updated with newer federal data, principally those from the Centers for Disease Control and the National Center for Health Statistics. Additional computations and rankings were performed by Metropolitan Life Insurance Health and Safety Education personnel.

Selected data are highlighted in an effort to make comparisons both between and among states. These data, when used

in conjunction with other lifestyle and/or environmental factors, provide a statistical overview of the problems faced by individual states as a step toward reformulating existing social policy.

State Socioeconomic Differences

As seen in Table 1, approximately one in eight U.S. residents was age 65 or over in 1989. This proportion ranged from 18 percent in Florida and 15 percent in Pennsylvania and Iowa, to just over 4 percent in Alaska and between 7 percent and nearly 10 percent in Utah, Wyoming and Colorado. As expected, for the most part the proportion of residents on Social Security mirrors the distribution of the elderly by state. A little more than 15 percent of the total population receives Social Security—with Alaska reporting the low (6 percent) and Florida the high—with one in five Floridians receiving Social Security benefits.

Just over 15 percent of total U.S. population received Social Security benefits in 1989.

While poverty affected almost 13 percent of the U.S. population, there was more than an eightfold difference between the extremes by state. Connecticut had less than 3 percent of its population with family incomes below the poverty level compared with 23 percent of Louisiana residents and 22 percent in Mississippi. Connecticut was followed by Rhode Island, New Hampshire, Vermont, Utah, New Jersey and Wisconsin, each with less than 9 percent of their populations living below the poverty level—one-third lower than the national average. Joining Mississippi and Louisiana at the other end of the spectrum were the

District of Columbia, Arkansas, Tennessee, Alabama and New Mexico.

The obverse of these poverty statistics is reflected in the reports of per capita income. Except the District of Columbia, where per

Per capita health expenditures averaged \$2,425 in the United States in 1990.

capita income averaged 30 percent above the U.S. total of \$16,489, an inverse relationship generally obtained between state poverty rates and per capita income levels.

Per capita health care expenditures averaged \$2,425 across the United States in 1990. Again, substantial variation was evident between states (Figure A). These health expenditures ranged from 25 percent higher than average in Massachusetts to 30 percent lower in South Carolina. Another aspect of these economic statistics is seen in the proportion of residents without health insurance coverage (Table 1). Nationwide, 14 percent of Americans had no health insurance in 1988. This proportion was the highest in the sunbelt states, principally in New Mexico, Texas, Louisiana, Nevada, Oklahoma and Mississippi where between one in five and one in four residents were not covered by health insurance. Michigan, Iowa and Rhode Island had the lowest proportion of uninsured (8 percent or less) followed by Pennsylvania and Massachusetts with proportions between 8.5 percent and 9 percent.

Measures of Health Status

The states differed even more widely in terms of selected health status indicators (Table 2 and Figure B). For instance, in two health measures with underlying social

Table 3—Selected Medical Care Utilization, United States, 1989

	Occupancy* Rate of Hospitals	Emergency Room Visits Per 1,000	Outpatient Visits Per 1,000
United States	69.6	361.5	1,057.5
New England			
Connecticut	80.4	397.0	1,084.9
Maine	75.1	479.2	1,183.0
Massachusetts	78.2	490.2	1,509.1
New Hampshire	70.6	470.1	1,226.3
Rhode Island	82.6	473.1	815.3
Vermont	69.5	308.8	1,028.7
Middle Atlantic			
New Jersey	80.3	334.2	941.5
New York	86.8	385.9	1,422.7
Pennsylvania	74.7	403.4	1,280.6
East North Central			
Illinois	67.4	349.0	1,140.1
Indiana	63.3	345.0	1,146.5
Michigan	67.9	365.6	1,330.0
Ohio	67.7	422.8	1,194.7
Wisconsin	67.4	311.3	1,018.5
West North Central			
Iowa	65.8	314.9	1,175.7
Kansas	61.8	313.0	1,358.3
Minnesota	67.5	263.3	748.5
Missouri	66.1	345.3	1,017.2
Nebraska	60.2	250.0	1,062.5
North Dakota	63.7	305.5	1,090.0
South Dakota	61.7	269.6	1,325.7
South Atlantic			
Delaware	78.4	390.2	1,248.0
District of Columbia	82.7	840.2	3,716.5
Florida	64.1	354.2	775.0
Georgia	65.3	439.4	910.7
Maryland	79.6	332.1	1,020.0
North Carolina	75.2	388.6	836.8
South Carolina	70.9	396.6	873.3
Virginia	71.2	376.9	919.1
West Virginia	63.0	503.3	1,046.9
East South Central			
Alabama	65.5	417.7	929.5
Kentucky	64.3	417.8	1,048.7
Mississippi	63.0	374.2	687.7
Tennessee	67.8	421.9	778.7
West South Central			
Arkansas	62.5	363.3	642.0
Louisiana	60.4	409.1	985.3
Oklahoma	60.8	333.7	850.6
Texas	60.3	294.1	773.0
Mountain			
Arizona	64.8	326.4	1,120.7
Colorado	67.1	312.2	1,275.3
Idaho	59.0	277.7	846.2
Montana	61.3	301.5	977.1
Nevada	60.4	373.1	682.1
New Mexico	64.3	335.2	1,585.3
Utah	61.2	333.2	1,146.5
Wyoming	57.9	369.6	994.2
Pacific			
Alaska	52.4	417.6	1,943.4
California	67.1	313.2	956.9
Hawaii	82.8	322.0	2,074.5
Oregon	64.4	316.1	926.2
Washington	64.9	342.9	1,042.1

* Ratio of average daily censuses to average number of beds.
Source: Same as Table 1.

Selected Demographic and Health Characteristics—State Variations, 1988-1991

implications (infant death rates per 1,000 live births and AIDS case rates per 100,000 population), the rates varied by as much as 168 percent for infant deaths and by more than 300-fold for AIDS case rates. The District of Columbia had the dubious

The District of Columbia had the highest rate of infant deaths, low birth weight babies, total deaths and reported cases of AIDS.

distinction of leading in all four of the health status measures listed in Table 2, however. (Its rates for infant deaths, low birth weight babies, total deaths and AIDS cases were the highest among all areas of the country.) States with less favorable rates in one of the listed health indicators tended to be comparably ranked in all four. Interestingly enough, however, there is much less uniformity among the states with the better health status rankings.

Utilization of Medical Services

In 1989 the occupancy rates of hospitals across the country averaged almost 70 percent (Table 3). This rate varied considerably between states, however, with New York's occupancy rate of 86.8 percent leading the nation. The New York rate was 25 percent higher than the average and 66 percent higher than the low rate of 52.4 percent in Alaskan hospitals. Hospitals in Hawaii, the District of Columbia, Rhode Island, Connecticut and New Jersey also had occupancy rates more than 80 percent. Occupancy rates in Wyoming and Idaho were relatively low, averaging between 57 percent and 59 percent in 1989.

While emergency room (E.R.) visits averaged 361.5 per 1,000 population for the United States as a whole, there was extreme

**Selected Demographic and Health
Characteristics—State Variations, 1988-1990**

variability by state. Once again, the District of Columbia stands out with an average of 840.2 E.R. visits in 1989—a rate 132 percent above the norm for the country. The state that ran a distant second was neighboring Virginia with 503.3 emergency room visits per 1,000, 39 percent above the U.S. average. These high rates are contrasted with those in three states in the West North Central area (Nebraska, Minnesota and South Dakota) and Idaho, in the Mountain region, where rates averaged about 25 percent below the U.S. average.

Outpatient visits outnumbered emergency room visits by almost three to one across the country in 1989. The District of Columbia experienced the highest rate of outpatient visits (3,716.5 per 1,000), a rate more than four times their high E.R. visit

Hospital occupancy rate averaged almost 70 percent across the country in 1989 with considerable variation between states.

rate and three-and-one-half times higher than the U.S. norm. The second highest outpatient rate was in Hawaii with the 2,074.5 visits per 1,000—almost double the total U.S. rate and outnumbering their emergency room visits by six to one. Outpatient visits were the lowest in Mississippi, Nevada and Arkansas with rates between 35 percent and 39 percent below the U.S. average.

Where the poor live and work corresponds to areas of high morbidity and mortality, and high utilization of emergency room facilities. Questions arise about other factors that influence these and similar health data, particularly the situation

extant in the District of Columbia. The concentrations of the poor and uninsured need local, state and federal policy attention in terms of programs to counter poverty and to enhance the health status of the entire country.

The ratio of outpatient to emergency room visits in the United States in 1989 was 2.9:1.

As these data demonstrate, national health statistics, both behavioral and medical, vary widely by geographic area. Somehow, such regional and lifestyle factor differences need to be considered when social policies are debated and implemented. MetLife encourages the process of continued collection, dissemination and analysis of large data sets on a regional and national level, in order to form a basis for new policies for a healthier America. □

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Use of Survey Data in a Corporatewide Health Promotion Program: The MetLife Experience

RECAP

Use of Survey Data

MetLife developed a corporate-wide health promotion program based on a survey of its employees, its local management, and its medical personnel. The survey's goals were to determine the wellness topics of **greatest interest** to employees, as well as topics believed by local management and medical personnel to be of **greatest need**. There was surprising unanimity concerning what employees **said they wanted** and what managers and medical personnel **believed were needed**. Stress management—including relaxation techniques and time management skills—was high on all three surveys, as were the basics of nutrition, exercise, healthy aging, cancer, and men's and women's health issues. □

This article describes a 1991 MetLife employee health needs survey to guide development of a corporate program, *Working On Wellness (WOW)*. Extensive studies show that health promotion programs based on the needs of the recipient population have the best chance for success.* With that in mind, as part of the WOW program, a survey was conducted among employees, local management (i.e., the officer or director in charge of dispersed office locations), and medical personnel to delineate the health needs of MetLife employees.

Extensive studies show that health promotion programs based on the needs of the recipient population have the best chance for success.

Survey Design

Items for the three survey instruments were suggested by the Company's medical personnel and by its specialists in health promotion, employee benefits and communications.

The employees' survey included 44 health topics grouped within 11 more general categories (e.g., stress and relaxation skills were subtopics within mental wellness). Employees were asked which topics were of most interest to them, and their responses were categorized by age and gender. This breakout was key to understanding the wide range of needs among men and

*Green, L. and Kreuter, M. *Health Promotion Planning: From Precede to Proceed*. Mayfield Publ. Co., Palo Alto, Calif., 1991.

women of various ages, thus making it possible to prepare campaigns and materials inclusive of the total range. Local MetLife offices offering the WOW program could customize any of the corporately designed health campaigns by examining the demographics of their own staffs, and by conducting local needs assessments to validate the approach.

The management and medical personnel surveys included questions on health problems causing the greatest disruption in the work environment, as well as an estimate of health topics on which employees wanted the most information. These surveys, as well as the employees' survey, contained questions about interest in, and desirability of, having exercise facilities at the worksite.

A stratified sample of 4,944 individuals representative of the Company's employee population by age, gender, and job re-

sponsibility was selected. Smaller surveys were made of all corporate medical personnel (59 persons) and senior management of different corporate offices (81 persons). The response rates, respectively, were: employees—51 percent; medical personnel—61 percent; senior management—45 percent.

Local MetLife offices offering the WOW program could customize any of the corporately designed health campaigns by examining the demographics of their own staffs, and by conducting local needs assessments to validate the approach.

Figure A—Position Title of Respondents

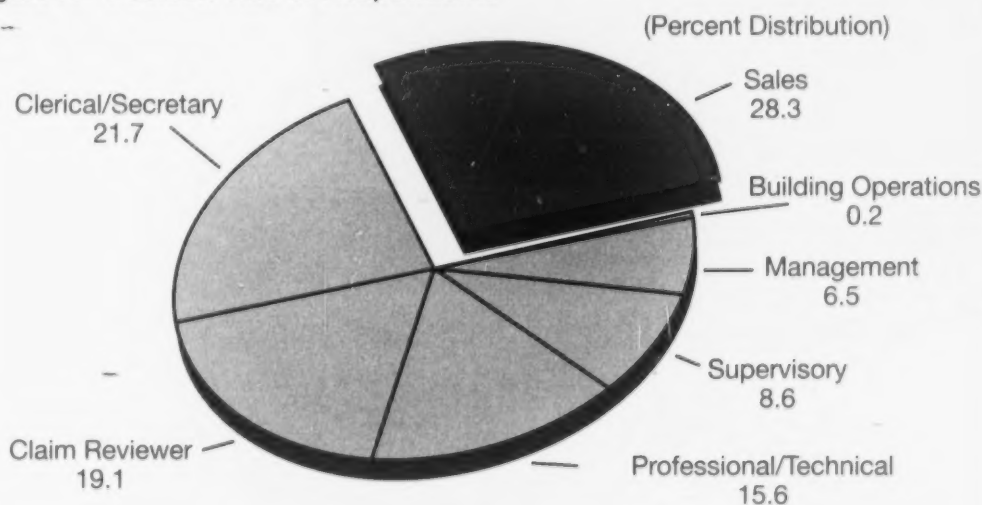
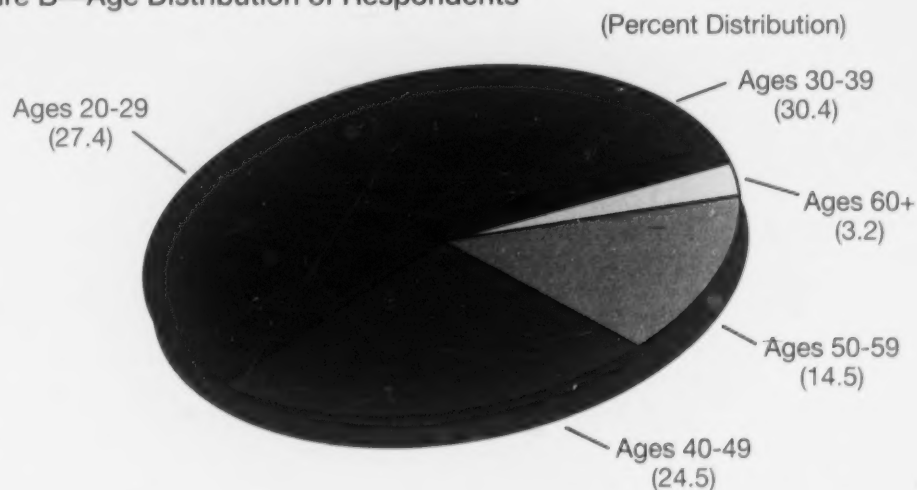


Figure B—Age Distribution of Respondents



Findings

These favorable survey response rates were the first indication of enthusiasm for the *Working On Wellness* program. These are some highlights:

- Stress/Emotional Health was of greatest interest to all respondents. It was employees' top choice and identified by both medical and management personnel as the most common "medical situation" affecting employees—one they would most like to see addressed.
- Exercise Facilities were high on the list. Seventy-three percent of employees without access to an on-site facility would like to have one. Most senior managers were in favor of on-site facilities, although many expressed concerns about space, staffing and cost.
- More than 25 percent of senior management expected a wellness

program to reduce absenteeism. Others noted the potential for increased productivity. Strategies recommended for success included ensuring access, involvement and enthusiasm, and communicating effectively.

Employees' Survey

The Employee Population: Figure A presents the occupational distribution of employee respondents, which generally correlates with the Company profile.

The majority of respondents were in sales, clerical and secretary positions. Sales, professional/technical and claim reviewer combined accounted for 69.1 percent of the respondents, while management and supervisory personnel represented 15.1 percent of the respondents.

Figure B shows the age groupings. Employees aged 20 to 49 made up 82.3 percent of the respondents, which

compares favorably with their actual proportion within the Company (approximately 85 percent). Nearly 58 percent were aged 20 to 39.

Most senior managers were in favor of on-site exercise facilities, although many expressed concerns about space, staffing and cost.

Employee Interest in Broad Health Categories

Employees were asked to check wellness subtopics they wanted to learn more about and then circle the three general categories of greatest interest. As can be seen from

Table 1, responses of men and women were very similar with one notable exception: men ranked Men's Health Issues second while women ranked Women's Health Issues third. This table indicates that Emotional Health, especially Stress Management, was of concern to most employees. Exercise/ Diet was another popular category, as was Heart Health.

The Pregnancy/ Parenthood category received few votes. However, Table 2 shows Parenting or Family to be of concern to younger employees—those beginning families or perhaps ones with young children at home.

Responses by Age: Variations among age groups can probably be explained by the life events and health challenges commonly faced by people of those ages. However, there was a relative lack of interest in Current Wellness Issues which included such topics as AIDS, sexually-

Table 1—Employees' Health Category Rankings

Rank	Total	Men	Women
1	Emotional Health	Emotional	Emotional
2	Exercise/Diet	Men's Health Issues	Exercise/Diet
3	Heart Health	Exercise/Diet	Women's Health Issues
4	Women's Health	Heart Health	Heart Health
5	Healthy Aging	Healthy Aging	Healthy Aging
6	Men's Health Issues	Medical SelfCare	Medical SelfCare
7	Medical SelfCare	Current Wellness Issues	Current Wellness Issues
8	Current Wellness Issues	Women's Health Issues	Family Health
9	Family Health	Occupational Health	Men's Health Issues
10	Occupational Health	Family Health	Occupational Health
11	Pregnancy/Parenthood	Pregnancy/Parenthood	Pregnancy/Parenthood

Source: 1991 MetLife Health Promotion Survey.

Table 2—Employees' Ranking of Categories by Age Group

	Rank				
	Age				
	20-29	30-39	40-49	50-59	60 and over
1. Emotional/Health	1	1	1	1	2
2. Exercise/Diet	2	2	6	3	4
3. Heart Health	3	3	3	2	3
4. Pregnancy/Parenthood	4	11	11	11	11
5. Women's Health	5	4	2	5	7
6. Men's Health	6	5	5	6	6
7. Healthy Aging	7	6	4	4	1
8. Family Health	8	7	9	9	9
9. Current Wellness	9	8	8	8	8
10. Medical SelfCare	10	9	7	7	5
11. Occupational Health	11	10	10	10	10

Source: 1991 MetLife Health Promotion Survey.

transmitted diseases, drug abuse, accident prevention and violence.

Highlights of the analysis by age category include:

- Employees aged 20-29 years were interested in personal health issues (emotional well-being, exercise and heart health). They were also interested in pregnancy and parenting. Surprisingly, this group ranked healthy aging above other topics with seeming greater pertinence for them, e.g., current wellness issues.
- Employees 30-39 years of age had high interest in emotional well-being and stress management, exercise/diet, heart health and women's and men's health issues. Healthy aging, family health and current wellness issues were in the middle of their list.
- Employees aged 40-49 placed emotional well-being at the top of their list but were at variance with the other groups in placing women's health issues second. This group also had stronger interest in healthy aging and medical self-care than did the two younger groups. Exercise appeared to be of less importance to them than to any other group.
- People 50-59 years of age had strong interest in emotional well-being and heart health as well as exercise. Healthy aging, women's and men's health issues and medical self-care were of moderate concern.
- Employees aged 60 years or older chose healthy aging as No. 1, followed by emotional well-being and heart health. They had moderate interest in exercise and diet, and listed medical self-care higher than any of the other four groups.

Table 3—Employees' Ranking of Subtopics by Sex

Women		Rank	Men	
Subtopic	Percent		Subtopic	Percent
Relaxation Techniques	71.8	1	Threats to Men	73.0
Cooking	68.5	2	Relaxation Techniques	68.9
Weight Loss	66.1	3	Cholesterol/HBP	67.1
Cancer	65.2	4	Cancer	63.7
Cholesterol/HBP	65.0	5	Time Management	60.4
Nutrition	64.7	6	Nutrition	58.6
Breast Cancer	63.8	7	Cooking	58.3
Women's Stages	63.3	8	Exercise & Aging	57.2
Starting Exercise	60.3	9	Weight Loss	55.5
Exercise & Aging	58.5	10	Starting Exercise	54.3
Anxiety/Depression	54.0	11	Men's Stages	53.4
Time Management	51.4	12	Communication	48.3
Communication	51.0	13	Anxiety/Depression	46.0

Source: 1991 MetLife Health Promotion Survey..

Interest in Specific Health Topics: The employees' survey contained 44 specific health topics. Table 3 lists only those subtopics selected by roughly 50 percent

Cancer ranked so high on the lists of both men and women that a decision was made to develop a general health campaign on that subject, alone.

or more of the respondents. Subtopics grouped into the category of Emotional Well-Being were highly selected by both men and women. Also important were relaxation techniques, anxiety/depression, time management skills, exercise and diet,

as were heart-health-related topics such as cholesterol and hypertension management. Additionally, the subject of cancer was high on the lists of both men and women. In fact, the subject was so widely selected that a decision was made to prepare a general health campaign on cancer rather than handling it as a subtopic under, for example, Chronic Degenerative Disease.

Management and Medical Personnel Survey

Medical personnel, senior managers and directors of dispersed offices were surveyed to determine which health issues seemed to recur and which were particularly disruptive to business. The outcome would be extremely useful in shaping a meaningful curriculum—one that would be more widely supported by the local decision-makers.

**Use of Survey Data in a Corporatewide
Health Promotion Program: The MetLife experience**

Questions on both the management and the medical personnel surveys were nearly identical. Responses concerning the threats to employees' health were very similar with one notable exception. Although stress was named by both groups as the most common medical situation affecting employees, managers thought that pregnancy/parenthood was the second most serious medical situation affecting their employees. Medical personnel ranked that issue fourth. An item of increasingly popular concern, caring for sick relatives, was ranked fifth by managers and eighth by medical personnel.

Depression/anxiety as well as overweight were top choices for both managers and medical personnel. Back pain, a condition widely reported as a common medical complaint interfering with work, was ranked fifth by medical personnel and seventh by managers (Table 4).

Additionally, managers and medical personnel were asked what wellness issues should be included in a health promotion program. As shown in Table 5, Emotional Health/Stress Management was cited most frequently. Exercise/Diet, Women's Health Issues and Current Wellness Issues were also top choices.

Although the primary purpose was to gather data to shape the wellness campaigns, the survey also provided an opportunity to gauge opinions on formats for the program's fitness component. The management group response concerning on-site exercise facilities was positive, with a few hesitations. More than 75 percent reported that exercise programs were not offered at their site, but more than 90 percent believed that employees wanted on-site exercise programs. Slightly more than 75 percent of senior management respondents favored the idea of on-site exercise facilities.

**Table 4—Medical and Management Ranking of Medical Situations
Believed to Affect Employees**

Condition	Total (73)		Medical (36)		Management (37)	
	Rank	Percent	Rank	Percent	Rank	Percent
Stress	1	86	1	92	1	81
Overweight	2	62	2	67	3	57
Depression/Anxiety	3	56	3	64	4	51
Pregnancy/Parenthood	4	49	4	36	2	62
Back Pain	5	36	5	36	7	35
Chronic Illness	6	34	6	31	6	38
Caring: Sick Relative	7	32	8	22	5	41
Smoking	8	29	7	31	8	27
Injury: Non-work	9	19	9	17	9	22
Dental	10	10	10	8	10	11

Source: 1991 MetLife Health Promotion Survey.

Table 5—Medical and Management Ranking of Topics to Include in a Corporatewide Wellness Program (Based on Believed Needs)

Condition	Total (73)		Medical (36)		Management (37)	
	Rank	Percent	Rank	Percent	Rank	Percent
Emotional/Stress	1	92	1	88	1	97
Exercise/Diet	2	81	3	72	2	89
Women's Health	3	75	2	77	3	73
Current Wellness Issues	4	68	4	69	4	68
Heart Health	5	63	5	61	5	65
Medical SelfCare	6	47	6	56	8	38
Family Health	7	44	7	39	7	49
Pregnancy/Parenthood	8	42	11	28	6	57
Men's Health	9	32	8	33	10	30
Occupational Health	10	32	9	31	9	32
Healthy Aging	11	22	10	31	11	14

Source: 1991 MetLife Health Promotion Survey.

Summary

A corporatewide survey was conducted to determine the needs and wants of MetLife employees regarding health promotion programming. These data were used to develop 10 health campaigns, any one of which could be chosen and "customized" to suit the specific demographics of a particular MetLife office. For example, an office with predominantly female employees may decide to offer Women's Health and Wellness as its first quarterly campaign. The Wellness Coordinator would further examine the demographics of the office to determine age distribution and most needed topics. Preliminary choices would be validated by asking the women which topics, in particular, they would like included.

Customization of programs fits in with MetLife's dedication to quality customer service. The corporate survey helped outline

the general approach. Further surveying locally should contribute to programs that will meet people's needs and make a real difference in the health and well-being of MetLife employees. □

James M. Corry, Ph.D.

Director

*Corporate Wellness & Fitness Services
Metropolitan Life Insurance Company*

Sharon L. Knauer

Manager

*Managed Care Center
Western Group Operations
Metropolitan Life Insurance Company*

STATISTICAL INFORMATION, PLEASE

Q *What are the leading causes of unintentional deaths at home among men and women?*

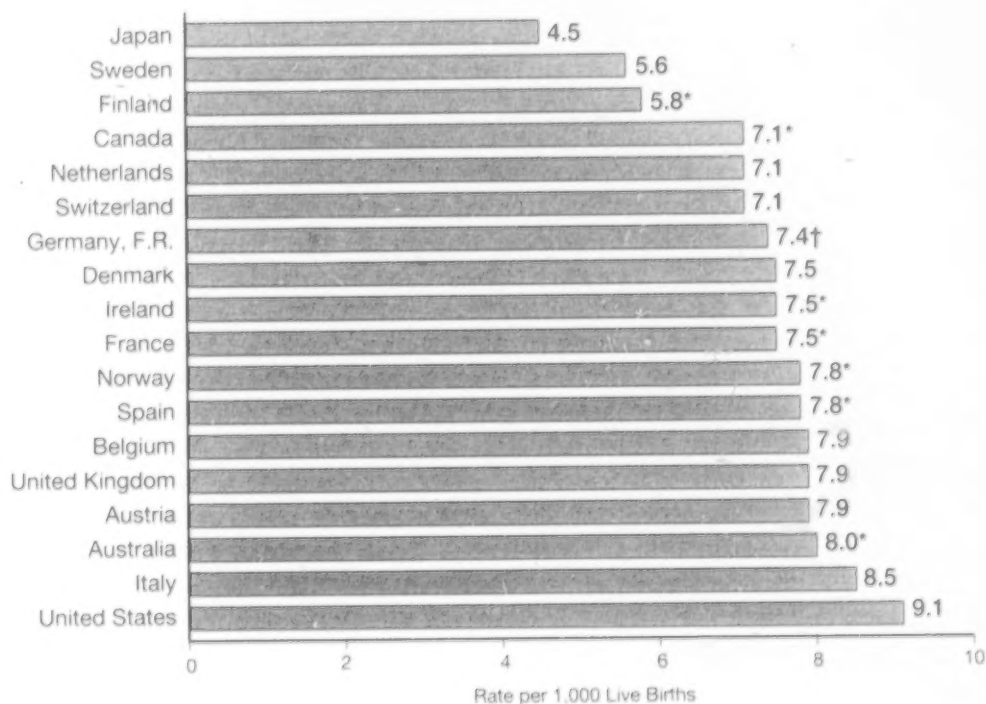
A Falls are the No. 1 cause of death among both men and women, according to data on unintentional injury mortality around the home, compiled by the National Center for Health Statistics. Overall, one-third of all fatal home accidents resulted from falls. Of these, 40 percent involved women and 26 percent, men. Fire ranked second, accounting for 27 percent in total, with 28 percent for women and 26 percent for men.

Q *What is the U.S. infant mortality rate and how does it compare with other developed countries?*

A The United States, with a 1990 provisional infant mortality rate of 9.1 per 1,000 live births, ranked 18th among selected developed countries. This 1990 rate represents the largest single-year decline in a decade, from that of 9.7 per 1,000 in 1989. Despite the progress, the U.S. rate is twice that of Japan, the nation with the lowest rate.

The following figure gives the latest infant mortality rates.

**Provisional Infant Mortality
in Selected Developed Countries, 1990**



* Data are for 1989.

† Data are for 1988.

Note: Ranking based on the latest data available.

Source: Population and Vital Statistics Report, United Nations, July 1991.

U.S. Expectation of Life, 1991

**Coming
in Future**

International Comparisons of Life Expectancy Among
Developed Countries

Issues

Update: Coronary Bypass Surgery Charges

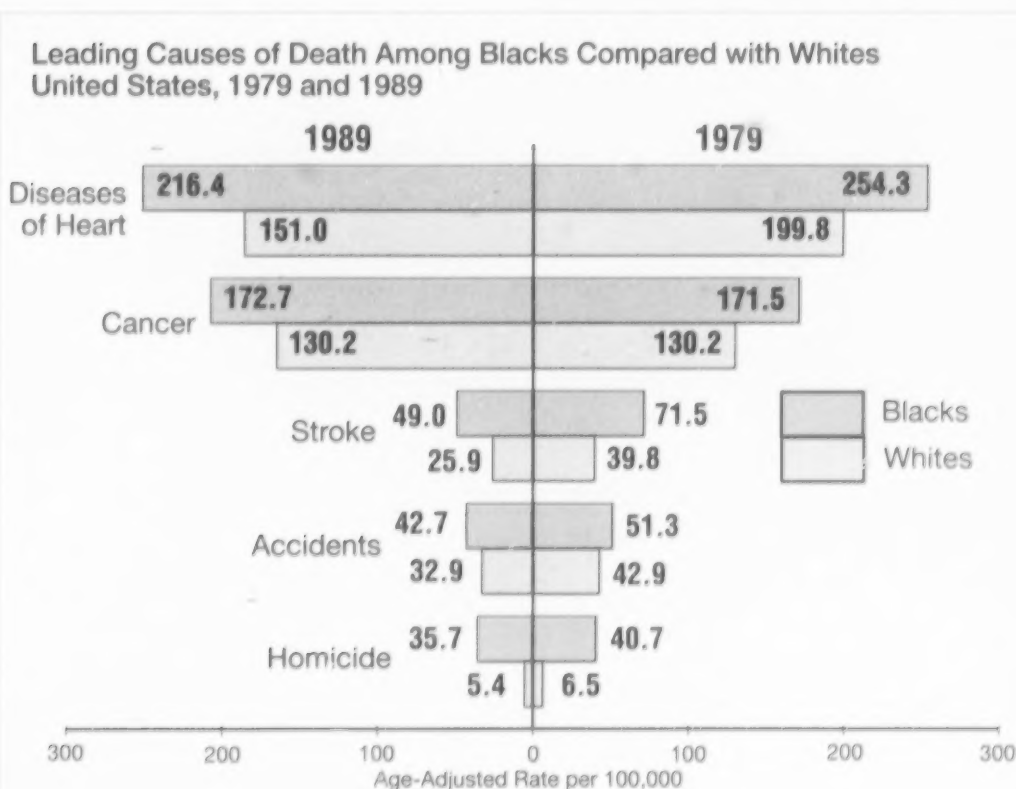
Anti-Arthritic Drugs: Regional Usage Patterns

Historical Perspectives

In 1989 death rates for African-Americans were much higher than for whites. Of the five leading causes of death among blacks, the largest differential was for homicide where the mortality ratio was 6.6 to 1, an increase from a decade earlier. The

black-to-white ratio for the other causes also increased, whereas, cancer remained virtually unchanged between 1979 and 1989.

The following figure presents the age-adjusted rates and ratios for 1979 and 1989.



*Rank based on 1989 mortality among blacks.
Source: Reports from the National Center for Health Statistics.

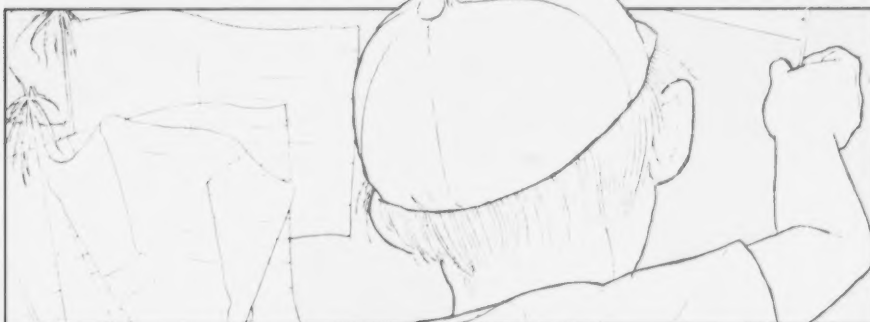
Rank*	Ratio Black/White	
	1989	1979
1	1.43	1.27
2	1.33	1.32
3	1.89	1.80
4	1.30	1.20
5	6.61	6.26



STATISTICAL BULLETIN

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2 U.S. Longevity at a Standstill

Life expectancy has not increased but the infant mortality rate continues downward, reaching an all-time low of 8.9 per 1,000 live births.

10 International Longevity Comparisons

17 Coronary Artery Bypass Grafts: 1990 Charges Update

25 Anti-Arthritic Medication Usage: United States, 1991

Contents

Statistical Bulletin Vol. 73, No. 3, Jul-Sep 1992

- 1 From the Editor's Desk
- 2 U.S. Longevity at a Standstill
- 10 International Longevity Comparisons
- 16 Capsule Briefs
- 17 Coronary Artery Bypass Grafts: 1990 Charges Update
- 25 Anti-Arthritic Medication Usage: United States, 1991
- 35 Letters to the Editor
- 36 Statistical Information, Please
- Back Cover: Historical Perspectives

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From the Editor's Desk

Osteoarthritis of the hips and knees has long been a common plague of the human condition. It has been found in Egyptian mummies as well as in the bones of cavemen.

In modern times, after age 65, the majority of people have X-ray evidence of osteoarthritis, and the proportion reaches 80 percent by age 75. Not surprisingly, much geriatric care is sought in its name.

Prevalence of Arthritis Treatment

In this issue, we report on the prevalence of arthritis treatment by nonsteroidal, anti-inflammatory drugs. Our analysis was based on a sample of 70.3 million prescriptions and information from these patients' physicians from data made available to SB by IMS-America. We found, for instance, that in the United States during 1991, there were three prescriptions for anti-arthritis drugs written for every 10 people. The expense of the drugs—excluding physician charges—was \$2.2 billion.

The treatment was provided by diverse physician specialties across the country. Internists and family practitioners rendered more than 50 percent of it, but orthopedic surgeons provided almost 20 percent. In the East North Central, West North Central, and Middle Atlantic regions, osteopathic physicians were also an important source of care. General practitioners were more involved in the South Central, Mountain and Pacific regions.

Regardless of who provided the prescriptions, the array of drugs described in the article indicates that definitive treatment remains elusive. No fewer than 20 brand-name drugs—prescription and nonprescription types—were identified in SB's study.

Osteoarthritis of the hip and knee is the most common form of arthritis. It has several causes, including old joint injuries, developmental diseases of infancy or childhood, diseases that deposit crystals in the joints

(such as gout), and obesity. For injury, developmental diseases, and crystal deposits, effective treatment of the underlying condition is the only sure road to prevention. Obesity is another matter.

Obesity and Osteoarthritis

The data implicating obesity as a major factor in osteoarthritis of the knee and hip are quite persuasive. Repeated epidemiological studies have shown an especially strong association between obesity and X-ray evidence of osteoarthritis of the knee. The logic of that linkage seems eminently reasonable when one considers the anatomy of joints. They are lined by a relatively thin layer of cartilage over the underlying bone. Importantly, cartilage does not regenerate after it has been damaged. In the normal course of life, the cartilaginous layer gradually thins with age. The greater pressure on the knee and hip joint caused by obesity, however, accelerates the thinning process.

It is likely that there isn't a threshold for the damage obesity does to large joints. That is, even modest overweight may increase the damage to knees. For instance, in the third *Health and Nutrition Examination Survey (HANES)*, it was shown that osteoarthritic X-ray changes in knees increased with each increment of weight for height. Whether all weight gain above a presumed "ideal" leads to osteoarthritis is not known, however.

Thus, it's not known how much lower the osteoarthritis prevalence might be, if obesity were not a public health issue. *HANES* data suggests, however, that the arthritis-obesity problem may increase in the future because average weight-for-height of Americans increased during the 1970s. In an aging population, higher future osteoarthritis rates—and related medical care expenses—may result unless that pattern is reversed. □

Charles B Arnold

U.S. Longevity at a Standstill

RECAP

No Longevity Gains

Life expectancy in the United States did not increase during 1991, remaining at the 1990 level of 75.4 years. For boys, it was 72.0 years and for girls, 78.8 years. On the other hand, the infant mortality rate continued downward when a new benchmark was achieved—an all-time low, 8.9 per 1,000 live births. Also encouraging was a marked improvement in longevity among black Americans that significantly narrowed the white-nonwhite differential. □

In 1991, there was a halt in the recent gains in U.S. life expectancy, according to preliminary life tables prepared by Metropolitan Life Insurance Company and 1990 provisional tables compiled by the National Center for Health Statistics.¹ Expectation of life at birth for the resident population, which rose from 74.9 years in 1988 to a record 75.4 years in 1990, remained at that level in 1991. Among newborn boys and girls, average future lifetime in 1991 stood at 72.0 years and 78.8 years—the same as in 1990 but 0.2 years above 1989, the last year for which final figures are available.² [See the accompanying article for a comparison of U.S. longevity with other international countries.]

If these 1991 and 1990 provisional life table results remain unchanged, then 1991 will mark only the fourth year (the others were 1980, 1985 and 1988) in the past two decades that an annual longevity increase was not recorded. Since 1971, expectation of life at birth increased faster among baby boys than among girls. Analysis of the life expectancy trend for infant boys reveals that, although their average remaining future lifetime was unchanged in 1991, it increased by one year since 1983 and 4.6 years since 1971. By comparison, among newborn girls, it took two additional years (since 1981) to increase another year and since 1971 they only added 3.8 years. As a result, the life expectancy sex disparity in favor of infant girls diminished since 1981 from 7.6 years to 6.8 years; this margin was first reached in 1987 and still stands. [See sidebar.]

Infant Mortality Rates Decline

Compared with these sporadic longevity plateaus, infant mortality rates have steadily decreased. Moreover, in the past few years the progress has been remarkable. In 1991, the rate fell to



David Johnson

**Table 1—Expectation of Life (in Years)
United States, 1979-81 to 1991**

Age	National Center for Health Statistics				Metropolitan Life Insurance Company 1991†
	1979-81	1988	1989	1990*	
Total Population					
0	73.9	74.9	75.3	75.4	75.4
15	60.2	61.0	61.3	61.5	61.4
25	50.8	51.6	51.9	52.1	52.0
35	41.4	42.2	42.5	42.7	42.6
45	32.3	33.0	33.4	33.6	33.5
55	23.9	24.4	24.7	24.9	24.9
65	16.5	16.9	17.2	17.3	17.3
75	10.5	10.7	10.9	11.0	10.9
85	6.0	6.0	6.2	6.3	6.1
Male					
0	70.1	71.5	71.8	72.0	72.0
15	56.5	57.6	57.9	58.1	58.0
25	47.4	48.4	48.7	48.9	48.8
35	38.2	39.3	39.6	39.8	39.7
45	29.2	30.3	30.7	30.9	30.8
55	21.1	22.0	22.3	22.5	22.4
65	14.2	14.9	15.2	15.3	15.2
75	8.9	9.1	9.4	9.4	9.3
85	5.1	5.1	5.3	5.4	5.2
Female					
0	77.6	78.3	78.6	78.8	78.8
15	63.8	64.3	64.6	64.7	64.7
25	54.2	54.6	54.9	55.1	55.0
35	44.5	45.0	45.3	45.4	45.4
45	35.2	35.5	35.8	36.0	36.0
55	26.4	26.6	26.9	27.0	27.0
65	18.4	18.6	18.8	19.0	19.0
75	11.6	11.7	11.9	12.1	12.0
85	6.4	6.3	6.6	6.7	6.5

* Provisional.

† Estimated.

8.9 per 1,000 live births—the lowest ever recorded. Last year's death rate during the first year of life marked the 29th consecutive year of annual declines. During 1990, the estimated newborn mortality rate was 9.1 per 1,000 live births. This represented a decline of 7 1/2 percent from the final 1989 figure of 9.8 per 1,000 live births which marked the first breakthrough of the 10 per 1,000 barrier.

Since 1971, expectation of life at birth increased faster among baby boys than among girls.

Last year's infant mortality rate decline was a major reason life expectancy at birth did not decrease. Table 1 shows the 1991 expectation of life values, by sex, at selected ages. Past infancy, at each age interval, 15 through 75 years, the estimated average future lifetime for men declined by 0.1 years during 1991, whereas among women a decrease occurred only at ages 25 and 75. At age 85 (where fluctuations tend to be greatest), the decline in remaining lifetime was 0.2 years for both men and women. Further, regarding the longevity differences by gender, at age 25, men could expect an additional 48.8 years of life and women another 55.0 years. At age 45, average future lifetime amounted to 30.8 years for men and 36.0 years for women. Life expectancy at age 65 was 15.2 years for men and 19.0 years for women.

Trends by Race and Sex

Table 2 shows that the recent trend of divergent longevity changes among blacks

and whites continued in 1990* (the latest year for which details by race and sex are available).¹ Between 1989 and 1990, blacks recorded marked increases in life expectancy, whereas whites experienced only fractional gains at some ages and, at some ages, white males even lost ground. For instance, in 1990 among whites, expectation of life at birth was 76.0 years (not shown)—72.6 years for boys and 79.3 years for girls. These figures indicate that between 1989 and 1990 life expectancy for all whites remained unchanged while there was a decline of 0.1 years for infant boys and a gain of 0.1 years for baby girls. By contrast, among black Americans born in 1990, average future lifetime is likely to be a record 70.3 years (also not shown)—1.1 years more than in 1989; the gain is expected to be 1.2 years for boys and 1.0 years for girls.

In 1991, the infant death rate fell to 8.9 per 1,000 live births—a new benchmark in the United States.

Blacks' substantial longevity gains may be ascertained from the top righthand section of Table 2. As shown, even past infancy there were notable expectancy gains among men and women. For example, expectation of life rose by at

* Figures for 1990 are provisional. Evaluative studies of past censuses by the Bureau of the Census indicate that some population groups are more completely enumerated than others. As a result, undercounts or overcounts among subgroups of the population could have substantial consequences on vital statistics measures.

least one year among men aged 15-45, and increased by as much as 0.6 years even at age 65. By contrast, between 1988 and 1989, average remaining lifetime declined by 0.1 years at birth and no gains were recorded at ages 15-35. In this period, at advanced ages, life expectancy among black men increased no more than 0.2 years.

Among black Americans born in 1990, average future lifetime is likely to be a record 70.3 years.

Black women's gains in life expectancy between 1989 and 1990 were not as pronounced as for men. Nonetheless, with the exception of age 85, each life expectancy value in 1990 was a new record high. Thus, at age 25, black women could anticipate 51.3 more years of life, while those aged 45 could expect an additional 33.1 years, and those aged 65 another 17.6 years.

Life Expectancy Gap Narrowed

As a result of these rapid longevity gains, Table 2 shows that the life expectancy gap has markedly narrowed among blacks, whites and all nonwhites in 1990. For instance, the gap in expectation of life between white and nonwhite girls at birth diminished to the smallest point ever—just 3.0 years. The differential between whites and blacks fell to 4.8 years—also a new record low. For instance, among baby boys the racial differences diminished to 4.2 years and 6.6 years, respectively.

Significant racial longevity convergence was also experienced among persons in midlife. In women age 45, for

In 1990, the gap in expectation of life between white and nonwhite girls at birth declined to the smallest point ever—just 3.0 years.

instance, the life expectancy differential between whites and blacks narrowed to just 3.1 years, while for men it was 3.5 years. At age 65, in 1990, white men could still expect to live 1.1 years longer than their black counterparts—a significant improvement compared with 1.6 years in 1989. For women aged 65, the longevity advantage of whites dropped to 1.4 years in 1990 from 2.0 years in 1989.

Chances of Survival

The chances of survival is another way to compare racial longevity differences. Thus,

among 1,000 white females born in 1990, 978 could expect to survive to age 35, but just 705 would reach age 75; the comparable values among 1,000 black females were 959 and 579. Among males, the likelihood of surviving to celebrate a 65th birthday was 760 per 1,000 for whites and 605 per 1,000 for blacks. As shown in the table, men had a much smaller chance of reaching their 85th birthday than did women—roughly half as large.

Despite nonwhites' rapid longevity gains, Table 3 shows that their mortality rates, by sex and by single years of age, remained generally higher than whites. Among men, longevity was greater among

Men had a much smaller chance of reaching their 85th birthday than did women—roughly half as large.

whites through age 73, was the same at ages 74 and 75 but, for older ages, favored nonwhites. For women, nonwhites' expectation of life values did not exceed

Whither Greater Gender Gap?

For several years *SB* has forecast that the gender-gap at birth would widen, yet it has not happened. That is, greater longevity differences between newborn boys and girls—favoring females—have been expected in this decade. Nevertheless, *SB* continues to expect this development. We know, for instance, that the mortality rate among men 25-44 years will continue to rise because of AIDS. Its rate of increase,

fortunately, has been slower than predicted as a result of improved drug treatment. Another offsetting demographic factor has been the return of large numbers of Armed Forces personnel from overseas; their addition is temporarily dampening the rise of age-specific death rates. Eventually, however, the adverse impact of AIDS on mortality rates will happen, resulting in decreases in men's life expectancy.

**Table 2—Expectation of Life at Selected Ages, by Race and Sex
United States, 1900-02 to 1990**

	White						All Other											
							Total						Black					
Age	1900-02	1949-51	1979-81	1988	1989	1990*	1900-02	1949-51	1979-81	1988	1989	1990*	1900-02	1949-51	1979-81	1988	1989	1990*
Expectation of Life (in Years)																		
Male																		
0	48.2	66.3	70.8	72.3	72.7	72.6		58.9	65.6	67.1	67.1	68.4	32.5		64.1	64.9	64.8	66.0
15	46.3	54.2	57.1	58.3	58.6	58.7		48.2	52.5	53.7	53.8	54.8	38.3		51.1	51.6	51.6	52.6
25	38.5	44.9	47.9	49.0	49.4	49.4		39.5	43.5	44.7	44.8	45.9	32.2		42.1	42.7	42.7	43.8
35	31.3	35.7	38.7	39.8	40.1	40.2		31.2	34.8	36.1	36.2	37.4	26.2		33.6	34.3	34.3	35.4
45	24.2	26.9	29.6	30.7	31.1	31.1	N/A	23.6	26.6	28.0	28.2	29.3	20.1	N/A	25.6	26.5	26.6	27.6
55	17.4	19.1	21.3	22.2	22.5	22.6		17.4	19.6	20.5	20.8	21.7	14.7		18.8	19.4	19.6	20.5
65	11.5	12.8	14.3	14.9	15.2	15.3		12.8	13.8	14.3	14.5	15.1	10.4		13.3	13.4	13.6	14.2
75	6.8	7.8	8.9	9.1	9.4	9.3		6.8	9.2	9.2	9.4	9.8	6.6		8.9	8.6	8.8	9.1
85	3.8	4.4	5.1	5.1	5.3	5.3		5.4	5.7	5.8	5.8	6.2	4.0		5.6	5.5	5.6	5.8
Female																		
0	51.1	72.0	78.2	78.9	79.2	79.3		62.7	74.0	75.1	75.2	76.3	35.0		72.9	73.4	73.5	74.5
15	47.8	59.4	64.3	64.8	65.1	65.1		51.4	60.7	61.5	61.7	62.6	39.8		59.7	60.0	60.2	60.9
25	40.1	49.8	54.6	55.0	55.3	55.4		42.4	51.1	51.9	52.1	52.9	33.9		50.1	50.4	50.6	51.3
35	32.8	40.3	44.9	45.4	45.7	45.7		33.8	41.7	42.5	42.7	43.5	27.5		40.8	41.1	41.3	42.0
45	25.5	31.1	35.5	35.8	36.1	36.2	N/A	26.1	32.8	33.5	33.7	34.5	21.4	N/A	31.9	32.2	32.4	33.1
55	18.4	22.6	26.6	26.8	27.1	27.2		19.6	24.7	25.1	25.3	25.9	15.9		24.0	24.0	24.1	24.7
65	12.2	15.0	18.6	18.7	19.0	19.0		14.5	17.6	17.8	17.9	18.6	11.4		17.1	16.9	17.0	17.6
75	7.3	8.9	11.6	11.7	11.9	12.0		10.2	11.7	11.5	11.6	12.2	7.9		11.4	10.9	11.0	11.5
85	4.1	4.8	6.3	6.3	6.5	6.6		6.2	7.2	6.8	6.9	7.4	5.1		7.1	6.6	6.7	7.1
Chances per 1,000 of Surviving From Birth to Specific Age																		
Male																		
15	780	957	982	986	986	986		930	971	977	976	979	597		968	973	973	976
25	739	943	966	972	973	972		903	952	957	955	957	533		948	952	950	950
35	682	925	950	956	957	955		859	919	924	922	924	465		911	913	910	912
45	614	890	925	931	932	930		787	866	871	867	873	392		850	847	844	850
55	525	805	863	879	881	879	N/A	651	760	781	778	792	300	N/A	734	744	740	754
65	392	635	724	754	759	760		452	585	626	626	654	190		551	579	578	605
75	214	381	477	523	535	538		255	362	406	409	445	89		327	355	357	392
85	53	120	185	214	226	226		99	145	160	168	190	20		124	126	132	149
Female																		
15	807	968	986	989	989	989		943	977	981	980	983	624		975	978	977	980
25	766	961	981	984	985	984		923	970	975	974	977	558		968	971	971	974
35	710	950	974	978	979	978		888	957	961	960	964	496		953	956	955	959
45	647	927	961	966	967	967		823	930	937	936	941	423		923	926	926	931
55	565	877	926	936	937	937	N/A	702	870	886	887	897	331	N/A	857	869	870	881
65	438	768	848	859	863	863		524	754	778	783	793	220		733	749	753	762
75	254	544	687	700	706	705		330	565	598	603	622	111		538	557	561	579
85	71	213	388	403	413	417		156	305	322	329	352	36		280	279	284	306

* Provisional.

Source: Various reports by the National Center for Health Statistics.

Table 3—Expectation of Life and Mortality Rates at Single Years of Age by Race and Sex, United States, 1989

Age	Expectation of Life (in Years)					Mortality Rate per 1,000				
	Total Persons	White		All Other		Total Persons	White		All Other	
		Male	Female	Male	Female		Male	Female	Male	Female
0	75.3	72.7	79.2	67.1	75.2	9.9	9.1	7.2	17.6	15.0
1	75.0	72.3	78.8	67.3	75.4	0.7	0.7	0.5	1.1	0.9
2	74.1	71.4	77.8	66.4	74.4	0.5	0.5	0.4	0.8	0.7
3	73.1	70.4	76.9	65.5	73.5	0.4	0.4	0.3	0.7	0.6
4	72.1	69.5	75.9	64.5	72.5	0.3	0.3	0.3	0.5	0.5
5	71.1	68.5	74.9	63.5	71.6	0.3	0.3	0.2	0.5	0.4
6	70.2	67.5	73.9	62.6	70.6	0.3	0.3	0.2	0.4	0.3
7	69.2	66.5	73.0	61.6	69.6	0.2	0.3	0.2	0.4	0.3
8	68.2	65.5	72.0	60.6	68.6	0.2	0.2	0.2	0.3	0.2
9	67.2	64.5	71.0	59.6	67.6	0.2	0.2	0.2	0.3	0.2
10	66.2	63.6	70.0	58.6	66.6	0.2	0.2	0.1	0.2	0.2
11	65.2	62.6	69.0	57.7	65.7	0.2	0.2	0.1	0.2	0.2
12	64.3	61.6	68.0	56.7	64.7	0.2	0.2	0.2	0.3	0.3
13	63.3	60.6	67.0	55.7	63.7	0.3	0.4	0.2	0.5	0.3
14	62.3	59.6	66.0	54.7	62.7	0.5	0.6	0.3	0.8	0.3
15	61.3	58.6	65.1	53.8	61.7	0.6	0.8	0.4	1.1	0.4
16	60.4	57.7	64.1	52.8	60.8	0.8	1.0	0.5	1.3	0.4
17	59.4	56.8	63.1	51.9	59.8	0.9	1.2	0.5	1.6	0.5
18	58.5	55.8	62.1	51.0	58.8	1.0	1.3	0.6	1.9	0.5
19	57.5	54.9	61.2	50.1	57.8	1.0	1.4	0.5	2.1	0.6
20	56.6	54.0	60.2	49.2	56.9	1.1	1.4	0.5	2.3	0.7
21	55.6	53.0	59.2	48.3	55.9	1.1	1.5	0.5	2.6	0.7
22	54.7	52.1	58.3	47.4	54.9	1.1	1.5	0.5	2.7	0.8
23	53.8	51.2	57.3	46.5	54.0	1.2	1.5	0.5	2.8	0.9
24	52.8	50.3	56.3	45.7	53.0	1.2	1.6	0.5	2.9	0.9
25	51.9	49.4	55.3	44.8	52.1	1.2	1.6	0.5	2.9	1.0
26	50.9	48.4	54.4	43.9	51.1	1.2	1.6	0.5	3.0	1.1
27	50.0	47.5	53.4	43.0	50.2	1.2	1.6	0.5	3.0	1.1
28	49.1	46.6	52.4	42.2	49.2	1.3	1.6	0.6	3.2	1.2
29	48.1	45.7	51.5	41.3	48.3	1.3	1.7	0.6	3.3	1.3
30	47.2	44.7	50.5	40.4	47.4	1.4	1.7	0.6	3.5	1.4
31	46.2	43.8	49.5	39.6	46.4	1.5	1.8	0.7	3.7	1.5
32	45.3	42.9	48.6	38.7	45.5	1.5	1.9	0.7	3.9	1.6
33	44.4	42.0	47.6	37.9	44.6	1.6	1.9	0.7	4.2	1.7
34	43.5	41.0	46.6	37.0	43.6	1.7	2.0	0.8	4.5	1.8
35	42.5	40.1	45.7	36.2	42.7	1.8	2.1	0.8	4.8	1.9
36	41.6	39.2	44.7	35.4	41.8	1.9	2.2	0.9	5.2	2.0
37	40.7	38.3	43.7	34.6	40.9	1.9	2.3	0.9	5.5	2.2
38	39.8	37.4	42.8	33.7	40.0	2.0	2.4	1.0	5.7	2.3
39	38.8	36.5	41.8	32.9	39.1	2.1	2.5	1.1	6.0	2.5
40	37.9	35.6	40.9	32.1	38.2	2.3	2.6	1.2	6.2	2.6
41	37.0	34.7	39.9	31.3	37.3	2.4	2.7	1.3	6.5	2.8
42	36.1	33.8	39.0	30.5	36.4	2.5	2.9	1.5	6.7	3.0
43	35.2	32.9	38.0	29.7	35.5	2.7	3.1	1.6	7.1	3.2
44	34.3	32.0	37.1	28.9	34.6	2.9	3.4	1.7	7.5	3.4
45	33.4	31.1	36.1	28.2	33.7	3.2	3.7	1.9	7.9	3.7
46	32.5	30.2	35.2	27.4	32.8	3.4	4.0	2.1	8.3	4.0
47	31.6	29.3	34.3	26.6	32.0	3.7	4.3	2.3	8.9	4.3
48	30.7	28.4	33.4	25.8	31.1	4.1	4.7	2.5	9.5	4.6
49	29.8	27.5	32.4	25.1	30.2	4.4	5.1	2.8	10.2	5.0
50	28.9	26.7	31.5	24.3	29.4	4.9	5.6	3.2	10.9	5.4
51	28.1	25.8	30.6	23.6	28.5	5.3	6.1	3.5	11.8	5.9
52	27.2	25.0	29.7	22.9	27.7	5.8	6.7	3.9	12.6	6.4
53	26.4	24.2	28.8	22.1	26.9	6.4	7.5	4.3	13.5	6.9
54	25.6	23.3	28.0	21.4	26.1	7.1	8.4	4.8	14.5	7.5
55	24.7	22.5	27.1	20.8	25.3	7.8	9.3	5.2	15.5	8.2
56	23.9	21.7	26.2	20.1	24.5	8.6	10.3	5.8	16.5	8.8
57	23.1	21.0	25.4	19.4	23.7	9.4	11.4	6.3	17.7	9.6
58	22.3	20.2	24.6	18.7	22.9	10.3	12.6	7.0	19.0	10.6
59	21.6	19.4	23.7	18.1	22.1	11.2	13.8	7.6	20.4	11.6
60	20.8	18.7	22.9	17.5	21.4	12.3	15.2	8.4	21.9	12.8
61	20.1	18.0	22.1	16.8	20.7	13.4	16.6	9.2	23.4	13.9
62	19.3	17.3	21.3	16.2	20.0	14.5	18.1	10.0	25.0	15.1
63	18.6	16.6	20.5	15.6	19.3	15.7	19.6	10.9	26.7	16.2
64	17.9	15.9	19.7	15.1	18.6	16.9	21.2	11.8	28.5	17.3
65	17.2	15.2	19.0	14.5	17.9	18.2	22.8	12.9	30.4	18.4
66	16.5	14.6	18.2	13.9	17.2	19.6	24.6	14.0	32.4	19.7
67	15.8	13.9	17.4	13.4	16.5	21.2	26.6	15.2	34.5	21.0
68	15.2	13.3	16.7	12.8	15.9	23.0	29.0	16.7	36.9	22.6
69	14.5	12.7	16.0	12.3	15.2	25.1	31.8	18.3	39.5	24.2
70	13.9	12.1	15.3	11.8	14.6	27.3	34.8	20.0	42.3	26.0
71	13.2	11.5	14.6	11.3	14.0	29.7	38.0	22.0	45.3	27.9
72	12.6	11.0	13.9	10.8	13.4	32.3	41.4	24.1	48.4	30.1
73	12.0	10.4	13.2	10.3	12.8	35.0	45.2	26.3	51.6	32.4
74	11.5	9.9	12.6	9.9	12.2	38.0	49.2	28.8	55.0	35.0
75	10.9	9.4	11.9	9.4	11.6	41.3	53.7	31.6	58.5	37.8
76	10.3	8.9	11.3	9.0	11.0	44.9	58.5	34.7	62.5	41.0
77	9.8	8.4	10.7	8.5	10.5	48.9	63.8	38.2	66.9	44.5
78	9.3	7.9	10.1	8.1	10.0	53.3	69.5	42.1	72.0	48.5
79	8.8	7.5	9.5	7.7	9.5	58.2	75.9	46.5	77.8	53.0
80	8.3	7.1	8.9	7.3	9.0	63.7	82.8	51.6	84.5	58.2
81	7.8	6.7	8.4	6.9	8.5	70.0	90.6	57.5	92.2	64.1
82	7.4	6.3	7.9	6.6	8.0	77.1	98.2	64.3	101.1	71.1
83	6.9	5.9	7.4	6.3	7.6	85.4	108.9	72.3	111.5	79.5
84	6.5	5.6	6.9	6.0	7.2	95.0	119.9	82.0	123.7	89.5
85	6.2	5.3	6.5	5.8	6.9					

Source: National Center for Health Statistics, Vital Statistics of the United States, 1989; Vol. II Sec 6, Life Tables, DHHS Publication No. (PHS) 92-1104.

whites until age 80. Mortality rates for each of the racial groups are shown on the right side of Table 3. At every age, nonwhite mortality rates were the same or larger than those for whites with a few exceptions among females during the middle teen years.

A mortality threshold (chance of dying) of 1.0 per 1,000 provides another measure of racial and gender differences. Other than at birth, for white women that threshold was not exceeded until age 38; for nonwhite women it was at age 25; white men, age 16; and nonwhite men, age 15. When the threshold is increased to 5.0 per 1,000, it was exceeded at age 48 for white men and age 54 for white women; among nonwhites it was crossed much earlier, age 35 for men, and age 48 for women.

The longevity plateau in 1991 does not diminish the prospects for future progress.

Future Directions

The longevity plateau in 1991 does not diminish the prospects for future progress. Life tables prepared by the Bureau of the Census, using a conservative approach, projected that by the year 2000 expectation of life at birth could rise to 73.5 years for males, and 80.4 years for females.³ These tables are being updated and will likely be adversely impacted by the human immunodeficiency virus (HIV) and its clinical sequelae, AIDS. In 1991, there were about 30,000 deaths due to HIV infection compared with a provisional count of 24,120 in 1990, and a final figure of 22,082 in 1989. In the ranking of leading causes, these 1991 HIV-related deaths, if confirmed,

would move it to ninth place. Further, the Centers for Disease Control has predicted HIV-deaths to climb rapidly in the near future.⁴ Notwithstanding this discouraging news, mortality rates from diseases of heart, the nation's leading cause of death, and stroke (third) continue to decrease. However, this encouraging cardiovascular trend does not extend to cancer—the country's second leading cause of death which may be the leading cause of mortality by the turn of the century.⁵ □

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International Longevity Comparisons

RECAP

U.S. Longevity Lags

Japan leads the world in life expectancy with an average future lifetime of 78.9 years. Iceland is next, followed by Sweden and Switzerland. The United States ranks 11th at 75.4 years. In the past decade, United States' men generally narrowed the expectation of life gap among other industrialized nations, but for the country's women the experience was uneven. These international longevity disparities for men and women in the United States narrowed considerably at later years of age. For instance, the United States-Japan expectancy gap is currently 2.0 years at age 45 and declines to about 0.9 years at age 65. □

Lxpectation of life for Americans does not compare favorably with longevity in other highly developed industrialized countries. According to the most recent available information, of 15 selected countries with traditionally low mortality (Table 1), life expectancy in the United States ranks 11th, about the same standing as nearly a decade ago.¹ Currently, the 1990 provisional United States life table, prepared by the National Center for Health Statistics, shows that expectation of life at birth for the total population was 75.4 years.² [See companion article for details by age, race and sex.] By comparison, Japan had a world-leading 78.9 years. Next in rank order were Iceland, at 78.0 years; Sweden, 77.6 years; and Switzerland, 77.4 years. These rankings are based on the individual country's life tables, obtained mainly from their official statistical office.

Analysis of international longevity at birth by sex generally reveals the same pattern, although differences in ranking by country do exist. For instance, in 1990 among men, the greatest expectation of life was in Japan, 75.9 years. Not far behind, however, were Icelandic men—only 0.2 years less. Ranked third, with a value almost a year lower, was Sweden where newborn boys' life expectancy was 74.8 years; they were followed by Switzerland with 74.0 years. In the United States, men's average future lifetime (72.0 years) placed them tenth—in a three-way tie with Denmark and France.

The longevity ranking of newborn girls in the United States during 1990 also fared poorly—11th out of 15 with 78.8 years. Once again, longevity was highest in Japan, 81.8 years, but women's rank order of the succeeding countries differed somewhat from men's. Infant girls in Switzerland could expect to live to 80.8 years and those in Sweden 80.4 years. In Iceland and France,

expectation of life at birth was 80.3 years. Other nations, where longevity of baby girls was at least 80 years, included the Netherlands and Australia.

Life expectancy in the United States ranks eleventh, about the same standing as nearly a decade ago.

The relative ranking of life expectancy at birth in Japan improved significantly since 1980/81 when for infant boys it ranked second worldwide (Iceland was first). At that time, for newborn girls in Japan, international standing was fifth (Switzerland was first). During this period, the Japan-U.S. longevity gap widened. Currently, the difference at birth is 3.9 years among baby boys and 3.0 years among infant girls.

In 1990, expectation of life at birth in Japan was a world-leading 78.9 years. Iceland was next, at 78.0 years.

On the positive side, however, since the early 1980s, United States men closed their life expectancy gap with other nations. In particular, the absolute difference in average remaining lifetime between the United States and the other countries shown in Table 2 narrowed, except for Australia, Germany and Japan. For instance, in 1981 expectation of life at birth in Sweden exceeded that in the United States by 3.0

Table 1—Expectation of Life at Birth Selected Industrialized Countries

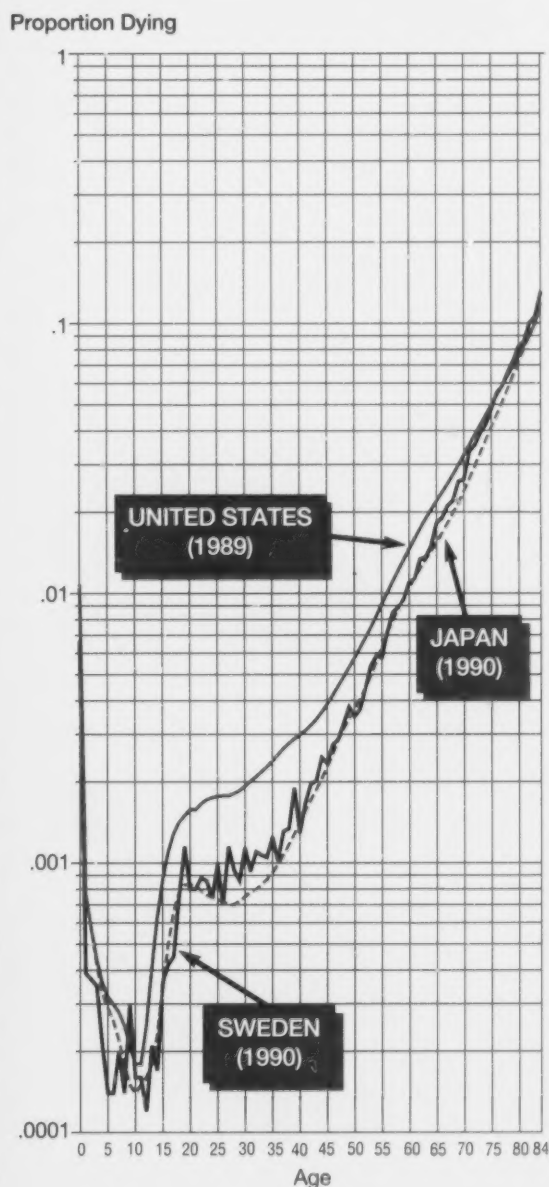
Country/Year	Total Persons*
North America	
Canada (1985-87)	76.4
United States (1990 Prov.)	75.4
Europe	
Denmark (1989-90)	74.9
Finland (1989)	75.0
France (1987)	76.2
Germany, F.R. (1986-88)	75.5
Iceland (1989-90)	78.0
Netherlands (1990)	77.0
Norway (1990)	76.6
Sweden (1990)	77.6
Switzerland (1989-90)	77.4
United Kingdom (1985-87)	74.8
Other Areas	
Australia (1990)	77.0
Japan (1990)	78.9
New Zealand (1987-89)	74.6



* Average of males and females.
Source: Table 2.

years; currently, it is 2.8 years. Similarly, in Switzerland, where the difference a decade ago was 2.6 years, it is now 2.0 years. On the other hand, the experience among baby girls was not as favorable. In fact, the longevity inequality widened in comparison with over half these countries.

Figure A—Comparison of Chances of Dying at Each Age, Among Men United States, Japan and Sweden



Source: Life tables from individual countries.

U.S. Longevity Improves With Age

At later ages, however, the longevity disparity diminished between the United States and nations with the most favorable expectancy (Table 2). Currently, at ages 25, 45 and 65, Japan has the best record for women and for men (except at ages 25 and 45, where Iceland was fractionally better).

The relative ranking of life expectancy at birth in Japan improved significantly since 1980/81.

Examination of the data discloses that at age 25, the U.S.-Japan gap is 3.0 years for men and 2.4 years for women. The difference narrowed to about 2.0 years at age 45 for both sexes and shrank to just 0.9 years at age 65.

Concomitant with the convergence of life expectancy values, the international ranking of the United States rises with increasing age. By age 65, the United States' standing ties with Sweden for fourth place among men, while for women it is in a three-way tie with Sweden and Australia for sixth place.

Life tables were constructed from mortality rates. A visual representation made of these values for the United States, Japan and Sweden are presented in Figure A (men) and Figure B (women). For U.S. men, at each age shown, mortality is consistently higher than for Japan or Sweden, where results are very similar. Swedish men's expectation of dying at the younger ages is lower than Japanese men's, but exceeds it at ages past 60. For these three industrialized countries, the mortality curve starts off at a comparatively high point (infant mortality), dips to a low at

about ages 5-10 and then climbs rapidly in the late teens and early twenties (mainly due to deaths from violent causes—motor vehicle accidents, homicide and suicide). Around ages 20-30, the escalation slows down before resuming an upward trend at the older ages. Among women, the curves showing the chances of dying in the United States, Japan and Sweden follow a similar pattern, with the United States' curve highest and Japan's usually the lowest.

Survival to Specific Ages

The number of persons per 1,000 surviving to specified ages is based on the mortality experience of a country, as shown in Table 3. The probability of surviving to age 25 can be seen as excellent for both men and women with little variation between countries. The same is true at age 45.

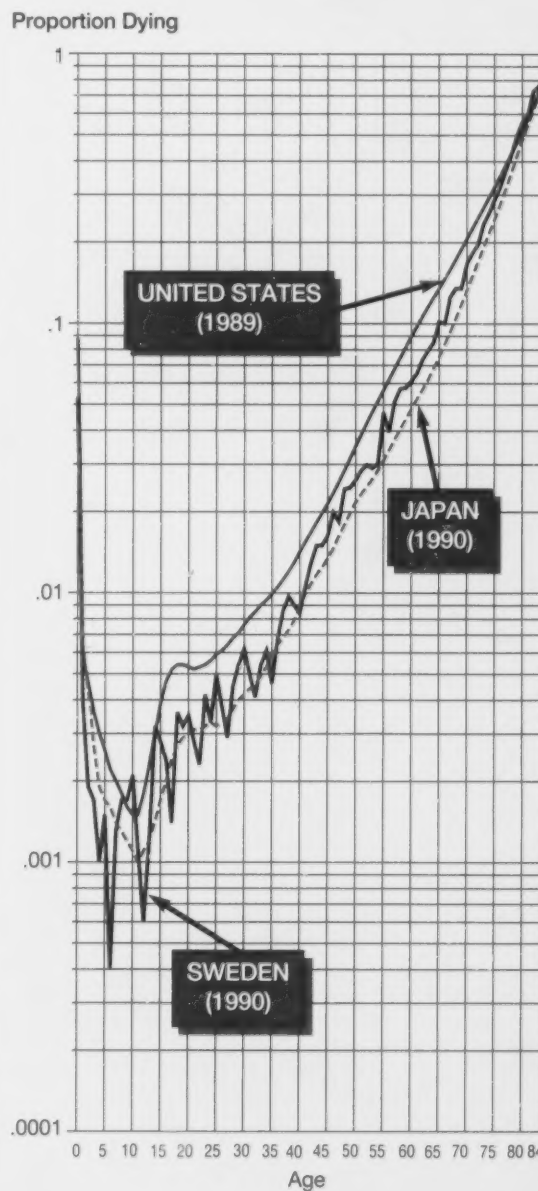
The chances of celebrating a 65th birthday, however, demonstrate mortalities' varying effects. For instance, among boys born in 1990 in the United States, only 744 out of 1,000 could expect to reach this age; in Iceland and Japan, the chances were around 831 per 1,000;

United States' men closed their life expectancy gap with other nations.

in Finland, they were 720 per 1,000. Among girls, 913 out of 1,000 born in Japan would likely survive to age 65. By comparison, in the United States the chances were 852, and as low as 838 per 1,000 in Denmark.

Worldwide, a small proportion of men and women survive to age 85. Once again, in these 15 countries those chances were best overall in Japan, but least for men in Finland, and for women in New Zealand.

Figure B—Comparison of Chances of Dying at Each Age, Among Women United States, Japan and Sweden



Source: Life tables from individual countries.

Table 2—Expectation of Life in Years, by Sex and Age
Selected Industrialized Countries

Country/Year	Male				Female			
	0	25	45	65	0	25	45	65
North America								
Canada (1985-87)	73.0	49.6	30.9	14.9	79.7	55.8	36.5	19.1
United States (1990 Prov.)	72.0	48.9	30.9	15.3	78.8	55.1	36.0	19.0
Europe								
Denmark (1989-90)	72.0	48.3	29.7	14.1	77.7	53.7	34.5	17.9
Finland (1989)	70.9	47.2	29.1	13.8	78.9	54.7	35.5	17.7
France (1987)	72.0	48.6	30.3	15.0	80.3	56.3	37.1	19.4
Germany, F.R. (1986-88)	72.2	48.7	29.9	14.1	78.7	54.7	35.4	17.8
Iceland (1989-90)	75.7	52.0	33.0	16.1	80.3	56.1	36.7	19.3
Netherlands (1990)	73.8	49.6	30.5	14.1	80.1	55.5	36.2	18.6
Norway (1990)	73.4	49.8	31.1	14.6	79.8	55.7	36.3	18.6
Sweden (1990)	74.8	50.9	32.0	15.3	80.4	56.2	36.9	19.0
Switzerland (1989-90)	74.0	50.6	32.0	15.4	80.8	56.8	37.5	19.6
United Kingdom (1985-87)	71.9	48.4	29.3	13.4	77.6	53.7	34.4	17.3
Other Areas								
Australia (1990)	73.9	50.5	31.7	15.2	80.0	56.1	36.7	19.0
Japan (1990)	75.9	51.9	32.9	16.2	81.8	57.5	38.1	19.9
New Zealand (1987-89)	71.6	48.7	30.1	14.1	77.6	54.0	34.8	17.8

Source: Life tables from individual countries and 1989 UN Demographic Yearbook.

It can also be seen in Table 3 that the likelihood of a newborn reaching this advanced age was about twice as great for women as for men.

For U.S. men, at each age, mortality is consistently higher than for Japan or Sweden.

International Comparisons

Comparisons of life expectancy in the United States with those of other nations are frequently made. However, inferences drawn from these analyses could be misleading. The United States does not have a homogeneous population as, for all intents and purposes, do the other 14 countries. The population composition of the United States is more ethnically diverse

**Table 3—Chances Per 1,000 of Surviving to Specified Age, by Sex
Selected Industrialized Countries**

Country/Year	Male				Female			
	25	45	65	85	25	45	65	85
North America								
Canada (1985-87)	975	943	773	218	986	970	873	426
United States (1990 Prov.)	969	920	744	221	983	962	852	409
Europe								
Denmark (1989-90)	980	942	751	182	986	966	838	364
Finland (1989)	977	929	720	167	989	971	886	360
Germany, F.R. (1986-88)	978	946	761	177	987	970	876	365
Iceland (1989-90)	980	956	831	272	990	976	878	446
Netherlands (1990)	982	957	795	187	988	972	883	407
Norway (1990)	979	948	793	208	988	973	889	407
Sweden (1990)	983	956	816	238	989	975	894	433
Switzerland (1989-90)	976	942	801	243	987	971	899	466
Other Areas								
Australia (1990)	975	945	797	235	986	972	887	431
Japan (1990)	984	962	826	275	990	978	913	489
New Zealand (1987-89)	966	932	758	180	981	962	849	359

Note: This information was not available for France and United Kingdom.
Source: Life tables from individual countries.

Worldwide, a small proportion of men and women survive to age 85.

and also contains relatively more persons of lower socioeconomic status. Therefore, with regard to rankings of international longevity, a case could be

made for a more equitable comparison if selected states, or group of states, were substituted for the U.S. national value. □

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Capsule Briefs

are timely selections with broad reader interest

The Social Costs of Alcohol Abuse

A dimension must be added by the reader to make complete this brief report on alcohol abuse.

The grief and anguish of the alcoholics' loved ones are not estimated in the social costs discussed below. Neither is the extent of suffering by children who have lost parents, spouses denied their mates, and parents who agonize about what might have been—Editor.

Alcohol abuse in the United States is a major public health problem. It is a causal factor in seven of the 10 leading causes of death, including heart disease, several cancers, stroke, unintentional injuries, homicide, suicide, and cirrhosis of the liver. In 1985, 94,768 deaths were attributed to alcohol abuse, yielding greater than 2.6 million person-years lost, or an average of 28.2 years lost *per death*.

(Medical Benefits) The majority of these lost lives were young men, through auto crashes or alcohol-associated violence.

Minority group members were at highest risk for death attributed to alcohol abuse, according to the federal government. For instance, the age-adjusted death rate (per 100,000) for African-American men in 1987 was 22, compared with 9.1 for the total population. Native Americans had even higher rates—25.9. Ambitiously, health objectives for the nation for the year 2000 set 12 and 13

deaths per 100,000, respectively, for these two groups. *(Healthy People 2000)*

It may seem puzzling that, despite the higher alcohol-related death rates for minority groups, their proportion of current users is lower than that of the white population. For African-Americans, 44.3 percent were current users, whereas among whites it was 55.1 percent. At each age group the differential also existed. *(Statistical Abstract)* The defining issue, however, is that the proportion who abuse alcohol is apparently more of a problem within minority groups.

Alcoholism is often regarded as a relatively common familial disease. About 43 percent of U.S. adults—76 million people—have been exposed to alcoholism in the family: they grew up with, or married an alcoholic or a problem drinker, or had a blood relative who was harmfully involved with alcohol. Perhaps the most sensitive part of the statistic was that 18.1 percent of U.S. adults reported living with an alcoholic during their first 18 years of life. *(Advance Data)*

The annual cost of alcohol abuse to the nation is staggering. In 1988 it was \$86 billion. The major cost sources are lost productivity, absenteeism, illness, premature death, traffic-related injuries, crime and law enforcement; or an estimated

\$253,076 per death. *(Medical Benefits)* The national costs have been projected as high as \$150 billion for 1995. *(Advance Data)*

Without investigation, the hidden costs of alcohol abuse are often difficult to recognize. For instance, in 1988 alcohol abuse costs in Wisconsin totaled nearly \$1.5 billion. Only \$344 million were direct costs, such as treatment-related, criminal justice, auto crashes, fire destruction or social welfare administration. The remainder were indirect costs, including health (mortality and morbidity—\$1.1 billion) as well as nonhealth (victim-related crime or incarceration). *(Morbidity and Mortality Weekly Report)* □

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Coronary Artery Bypass Grafts: 1990 Charges Update

RECAP

CABG Average Charges

During 1990, coronary artery bypass graft (CABG) operation charges among MetLife group health policyholders and dependents averaged \$43,370. Among the 16 states with at least 50 CABGs, the total charges ranged from a high of \$59,870 in California, to a low of \$32,500 in Wisconsin. Three-fourths of the total was due to the hospital bill, with wide variation by state. The New York hospital proportion of total charges was the lowest (64 percent), whereas hospital charges in Alabama averaged 80 percent of the bill for a CABG. Physician charges averaged \$11,220 across the country, ranging from \$15,170 in California to \$8,280 in Tennessee. Hospital stay averaged 11.6 days; patients in California and Alabama remained hospitalized for 10.2 and 10.3 days, respectively, whereas those in New Jersey had hospital stays of 16.1 days. □

It is estimated that close to 400,000 coronary artery bypass grafts (CABGs) were performed in U.S. nonfederal, short-stay hospitals during 1990.¹ The number of these surgeries has continued to climb since the 1970s and has more than doubled since 1982, when 170,000 were performed.² The rate of increase appears to be slowing, however; between 1988 and 1990 the number of CABGs increased 11 percent, as against 25 percent between 1986 and 1988, and 41 percent between 1984 and 1986.¹⁻⁵ CABG surgery remains one of the more expensive treatments for coronary artery disease (CAD) but one that has proven efficacious for relief of angina pain and for circumventing (bypassing) narrowed coronary arteries.^{6,7} While the consensus is that quality of life is improved (at least in the short term) and longevity, in many instances, is improved after CABG, the underlying disease is not removed and, consequently, about 10 percent to 20 percent of the patients need a second operation within 10 years.⁷⁻⁹

CABG continues to be popular among U.S. cardiovascular specialists despite dramatically increasing use of percutaneous transluminal coronary angioplasties (PTCAs) for selected CAD patients. While PTCAs are not used as widely as CABGs, their use is rapidly growing and the technology continues to improve.^{9,10} The impact of this on CABG rates, applicability, appropriateness, patient selection and cost effectiveness is of obvious import and continues as the subject of clinical trials both in the United States and abroad.¹¹⁻¹³

Concomitant with the increasing numbers of CABGs are changes in the demographics of the atherosclerotic patients undergoing this form of treatment.¹⁰ While the operation remains predominantly a male surgical procedure, increasingly more women and persons over age 65

in all regions of the country are undergoing it (Table 1). In addition, as experience accumulates with both CABG and PTCA procedures, there is a trend toward recommending CABG for patients with more severe disease, whereas PTCAs are more frequently recommended earlier in the disease process to prevent the first CABG or as a later measure to avoid a second CABG.⁷

The economic impact of the changes in patient characteristics and the increasing specialized use of CABG continue to be monitored by the government and private organizations. In a continuing effort to understand—and ultimately help contain—escalating medical/surgical costs, MetLife presents the most recent experience with charges for coronary artery bypass graft surgery. With cardiovascular diseases

Table 1—Coronary Artery Bypass Grafts: Trends in Selected Demographic Characteristics of Patients, United States, 1984-1990

Characteristic	1984		1986		1988		1990	
	Number*	Percent	Number*	Percent	Number*	Percent	Number*	Percent
Sex								
Male	156	77	214	75	270	76	286	73
Female	46	23	70	25	83	24	106	27
Age								
15-44	15	7	16	6	15	4	19	5
45-64	115	57	144	51	167	47	169	43
65 and Over	71	35	125	44	170	48	204	52
Region								
Northeast	18	9	39	14	74	21	90†	23†
New England								
Middle Atlantic								
Midwest	87	43	96	34	106	30	114†	29†
East North Central								
West North Central								
South	66	33	103	36	114	32	118†	30†
South Atlantic								
East South Central								
West South Central								
West	31	15	46	16	59	17	70†	18†
Mountain								
Pacific								
Total Operations	202	100	284	100	353	100	392	100
Percent Change From Previous Period								
					41		24	
							11	

* Numbers in thousands.

† Estimated.

Source: Selected reports from National Center for Health Statistics.

estimated to cost \$108.9 billion* in 1992, any effort to help control these costs should be investigated vigorously.¹⁴

Coronary artery bypass graft (CABG) operations are increasing in frequency among women and older persons.

Metropolitan Life Study

MetLife reviewed its latest complete data set for costs associated with CABGs among its group health policyholders and dependents aged 35-64. Using claims data for the calendar year 1990, MetLife statisticians examined average length of stay, and hospital and physician charges by region and state for claims associated with 2,564 typical[†] coronary artery bypass graft surgeries (CPT-4 Codes 33504, 33510-33528).

The study statistics reflect the national experience with CABG, as seen in Tables 1 and 2. CABGs are more frequently performed on men but now more women are also having the operation and, for both sexes, CABG frequency increases with age. In addition, the geographic distribution of the 1990 MetLife cases is like that reported for patients discharged from U.S. short-stay hospitals (Tables 1 and 3). That is, the largest proportion of cases was found in the South (45 percent of the MetLife data set, 30 percent nationally) followed by the Midwest region (29 percent and 26 percent,

respectively, U.S. and MetLife series). The Western area states reported the fewest CABGs in both data sets.

Major differences in the ages of the study patients were evident by sex; almost half of the female patients were 60 years or older compared with just over one-third of the men (Table 2). The procedure was almost \$2,500 more expensive for women than for men, primarily due to the extra 1.4 days of hospital confinement they experienced. These higher charges were fairly consistent across all states and regions and thus were combined with the data for men for further analytic purposes. The data will be presented for all 2,561 patients, but analyses will be restricted to the 16 states in which 50 or more CABG surgeries were reported to MetLife. These 16 states represent 1,962 bypass grafts and constitute 77 percent of the reported cases.

Geographic Variation in Charges

In 1990, the total hospital and physician charges to Metropolitan Life Insurance Company for a coronary artery bypass graft averaged \$43,370 (Table 3). This total was 10.4 percent (\$4,070) higher than that for 1989. By geographic area, the average

CABG claims charges to MetLife in 1990 averaged \$43,370, up 10.4 percent over those recorded in 1989.

charges differed by almost 50 percent; the total charges ranged from the high of \$56,650 in the Pacific states to a low of \$38,240 in the New England area. The Pacific area charges exceeded the U.S. average by 30 percent and were

* Includes costs of physician and nursing services, hospital and nursing home service, drugs and lost productivity.

[†] Typical surgeries exclude length-of-stay outliers and fall within 97.2 percent of the usual length-of-stay outliers in the diagnosis related groups (DRG) criteria.

Table 2—Selected Characteristics of Coronary Artery Bypass Graft Patients Aged 35-64, Metropolitan Life Insurance Company Group Health Claims 1989 and 1990

Characteristic	Percent Distribution					
	1989			1990		
	Male	Female	Total	Male	Female	Total
Age						
35-39	1.3	0.3	1.1	1.5	0.6	1.3
40-44	6.0	4.6	5.8	6.3	2.7	5.6
45-49	11.0	8.2	10.5	10.5	8.0	10.0
50-54	16.9	15.8	16.7	17.7	16.8	17.6
55-59	28.0	25.9	27.6	27.4	25.4	27.0
60-64	36.8	45.2	38.3	36.7	46.5	38.6
Total Number	(1,773)	(367)	(2,140)	(2,073)	(488)	(2,561)
Total Percent	82.9	17.1	100.0	81.0	19.0	100.0
Hospital Statistics						
Average Length of Stay (Days)	11.4	12.9	11.6	11.3	12.7	11.6
Average Hospital Charge	\$28,200	\$30,820	\$28,650	\$31,500	\$33,820	\$32,150
Average Physician Charge	\$10,660	\$10,620	\$10,650	\$11,120	\$11,280	\$11,220

Source: Claims data from Metropolitan Life Insurance Company merged and edited by Corporate Health Strategies, Inc. Analyses and computations by the Health and Safety Education Division, MetLife.

influenced by the high costs in California—38 percent higher than the average. Only two other areas, i.e., the Middle Atlantic and the West North Central, registered higher than average charges (10 and 0.1 percent, respectively). In contrast, almost identically low charges were reported in the New England and East North Central areas—both roughly 11 percent below the national average. The charges in the East South Central area were the third lowest, also under \$40,000.

Between State Variations

Among the 16 study states, the average total charges differed by 84 percent (Table 3). California led with charges almost twice those in Wisconsin, which were 25 percent below the average. Only five

other study states (i.e., Pennsylvania, New Jersey, Alabama, Florida and Indiana) had total charges above average; the charges ranged from 23 percent higher than the norm in Pennsylvania to 4 percent higher

Total costs varied by as much as 84 percent between the high charges in California and the low charges in Wisconsin:

in Florida, Ohio, Tennessee and New York joined Wisconsin with total CABG claims charges between 13 percent and 25 percent below the average. (See figure.)

Table 3—Average Charges for Coronary Artery Bypass Graft for Patients Aged 35-64, Metropolitan Life Insurance Company Group Health Claims, 1990

	Number of Cases	Average Charges (\$)					Average Length of Stay (Days)	Percentage	
		Total Hospital & Physician	Hospital Charge			Physician Charge		Hospital of Total	Ancillary of Hospital
			Total	Room & Board	Ancillary				
United States	2,561	43,370	32,150	7,010*	25,140*	11,220	11.6	74	78
New England	99	38,240	27,490	6,940	20,550	10,750	11.4	72	75
Connecticut	33	37,500	24,650	6,310	18,340	12,850	10.2	66	74
Maine	9	41,780	31,830	8,320	23,510	9,950	15.1	76	74
Massachusetts	34	41,030	31,220	7,940	23,280	9,810	11.3	76	75
New Hampshire	11	37,470	27,710	4,790	22,920	9,760	11.5	74	83
Rhode Island	5	33,690	24,010	6,260	17,750	9,680	10.2	71	74
Vermont	7	28,090	19,360	7,240	12,120	8,730	14.0	69	63
Middle Atlantic	297	47,870	35,110	9,960*	25,150*	12,760	14.2	73	72
New Jersey	90	51,760	38,430	10,380†	28,050†	13,330	16.1	74	73
New York	97	37,910	24,330	9,490†	14,840†	13,580	14.5	64	61
Pennsylvania	110	53,490	41,910	10,040	31,870	11,580	12.2	78	76
East North Central	524	38,470	28,360	5,770	22,590	10,110	11.1	74	80
Illinois	140	43,180	31,770	7,040	24,730	11,410	11.4	74	78
Indiana	74	43,410	32,690	6,040	26,650	10,720	12.3	75	82
Michigan	40	41,900	33,190	6,980	26,210	8,710	9.9	79	79
Ohio	216	34,580	25,430	5,390	20,040	9,150	10.8	74	79
Wisconsin	54	32,500	21,710	2,700	19,010	10,790	11.2	67	88
West North Central	145	43,510	33,540	7,490	26,050	9,970	12.4	77	78
Iowa	25	45,210	35,020	9,760	25,260	10,190	14.8	77	72
Kansas	29	51,410	41,280	7,530	33,750	10,130	13.2	80	82
Minnesota	21	36,180	26,890	4,610	22,280	9,290	10.4	74	83
Missouri	58	43,230	32,710	8,060	24,650	10,520	11.8	76	75
Nebraska	8	37,410	29,690	5,640	24,050	7,720	12.3	79	81
North Dakota	3	32,160	24,020	3,770	20,250	8,140	10.3	75	84
South Dakota	1	25,150	18,810	2,930	15,880	6,340	11.0	75	84
South Atlantic	449	42,060	31,320	6,280	25,040	10,740	11.1	74	80
Delaware	6	40,730	27,110	9,230	17,880	13,620	10.8	67	66
District of Columbia	13	45,050	35,030	5,130	29,900	10,020	8.8	78	85
Florida	158	45,150	32,960	8,380	24,580	12,190	11.2	73	75
Georgia	86	41,220	31,330	5,600	25,730	9,890	11.1	76	82
Maryland	19	29,060	18,360	5,300	13,060	10,700	10.8	63	71
North Carolina	90	43,230	32,750	5,200	27,550	10,480	12.5	76	84
South Carolina	22	35,510	27,660	4,560	23,100	7,850	10.9	78	84
Virginia	38	40,020	31,020	5,130	25,890	9,000	10.7	78	83
West Virginia	17	39,540	29,460	4,210	25,250	10,080	11.4	75	86
East South Central	231	39,430	30,580	4,930	25,650	8,850	11.1	78	84
Alabama	52	46,030	36,870	5,810	31,060	9,160	10.3	80	84
Kentucky	68	41,660	32,090	5,990	26,100	9,570	11.9	77	81
Mississippi	18	33,960	25,820	3,100	22,720	8,140	8.9	76	88
Tennessee	93	35,160	26,880	4,010	22,870	8,280	11.4	76	85
West South Central	482	41,620	30,170	5,760	24,410	11,450	11.8	72	81
Arkansas	37	28,740	19,950	2,690	17,260	8,790	10.0	69	87
Louisiana	42	49,460	37,510	6,490	31,020	11,950	11.8	76	83
Oklahoma	44	48,790	37,050	8,980	28,070	11,740	15.1	76	76
Texas	359	41,160	29,530	5,600	23,930	11,630	11.5	72	81
Mountain	84	43,230	32,020	6,320	25,700	11,210	10.0	74	80
Arizona	31	47,260	34,690	6,730	27,960	12,570	9.4	73	81
Colorado	10	41,680	32,040	8,730	23,310	9,640	10.5	77	73
Idaho	1	26,000	19,360	3,730	15,630	6,640	9.0	74	81
Montana	8	38,010	28,740	3,320	25,420	9,270	11.5	76	88
New Mexico	4	33,750	24,820	9,750	15,070	8,930	8.8	74	61
Nevada	14	50,640	36,950	6,320	30,630	13,690	9.1	73	83
Utah	13	35,180	26,360	4,900	21,460	8,820	11.6	75	81
Wyoming	3	39,500	28,660	4,600	24,060	10,840	9.7	73	84
Pacific	250	56,650	42,150	11,200	30,950	14,500	10.0	74	73
California	217	59,870	44,700	11,940	32,760	15,170	10.2	75	73
Hawaii	1	51,080	39,370	5,360	34,010	11,710	8.0	77	86
Oregon	15	41,510	31,360	7,790	23,570	10,150	10.0	76	75
Washington	17	29,310	19,370	5,090	14,280	9,940	7.5	66	74

Note: Highlighted states are those with 50 or more CABG procedures during 1990. Alaska had no surgeries within study parameters.

* Reflects estimates in New Jersey and New York.

† Estimated by MetLife Health and Safety Education personnel based on 1989 distribution of charges.

Source: Claims data from Metropolitan Life Insurance Company merged and edited by Corporate Health Strategies, Inc.

Analyses and computations by the Health and Safety Education Division, MetLife.

Hospital Charges

Hospital costs (room and board plus ancillary fees) contributed close to three-fourths of the total insurance charges for CABG operation (Table 3). These charges averaged \$32,150 across the country with

Hospital charges (room and board plus ancillary fees) comprised 75 percent of the total CABG charges to health insurance in 1990.

the portion of total costs ranging from a low of 64 percent in New York to a high of 80 percent in Alabama. Ancillary fees (operating room, laboratory, bloodbank, pharmacy charges, etc.) averaged \$25,140 and accounted for more than three-fourths of the total hospital bill. Again, substantial variation was evident by state in the proportion of the total hospital bill these fees comprised. While ancillary fees in Wisconsin were 24 percent lower than the U.S. average, they accounted for the highest proportion of the hospital bill among study states. A similar situation obtained in Tennessee. That is, ancillary fees were 9 percent lower than the U.S. but accounted for the second highest—85 percent—of the total hospital bill. Ancillary fees in New York, on the other hand, were 41 percent lower and accounted for only 61 percent of the hospital total.

Physician Charges

Physician charges represented one-fourth of the total costs to health insurance for CABG. The average physician costs were over \$11,000, with these fees differing by as much as 64 percent

between geographic areas. Physician charges were 21 percent lower than average in the East South Central area and 29 percent higher in the Pacific area. Between states, variation was even more, 83 percent. Physician fees were the highest in California, \$15,170, some 35 percent higher than the norm. In contrast, physician fees in Tennessee were 26 percent below the U.S. average (\$8,280). New York and New Jersey were ranked second and third in high physician charges—each with fees in excess of \$13,300, or at least 18 percent above the average.

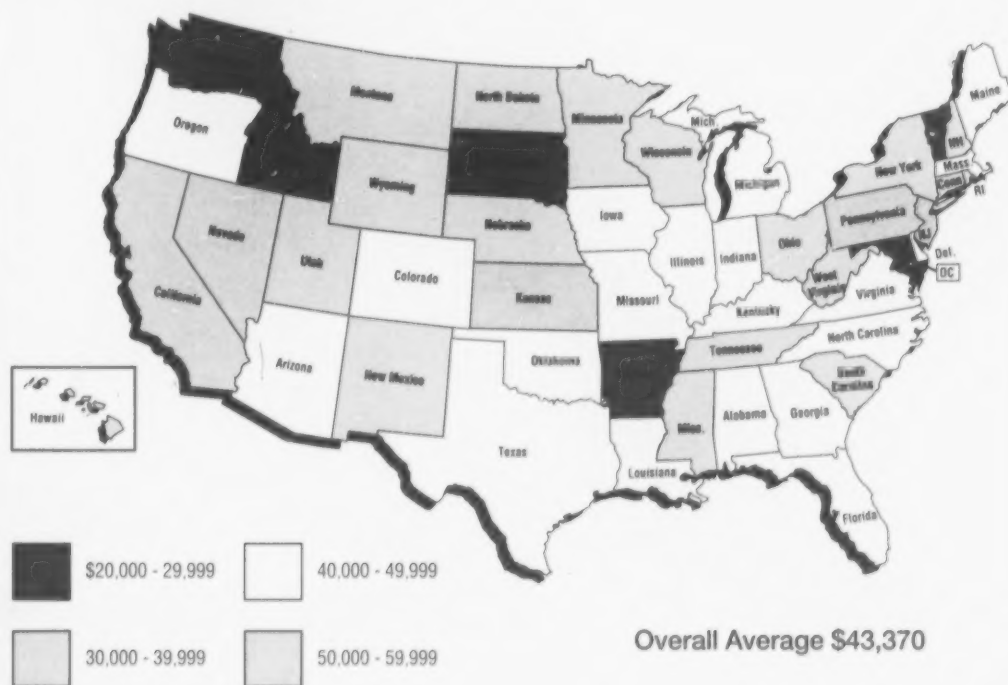
Length of Stay

On the average, CABG patients remained in the hospital for 11.6 days. Length of confinements differed between states by as much as 5.9 days, however. California registered the shortest length of stay while reporting the highest total and component costs for the surgery. In fact, the room and board fees in California were 70 percent

Physician fees averaged \$11,220 across the United States, with the charges in California and in New York being the highest—35 percent and 21 percent, respectively, above the average.

higher than average despite the length of stay being 12 percent below average. Hospital stays were the longest in New Jersey and New York with confinements 39 percent and 25 percent, respectively, higher than average. Alabama patients

State Variations in Average Charges* for Coronary Artery Bypass Grafts, 1990



* Charges for Metropolitan Life Group Health Claims.
Source: Table 3.

averaged the second lowest number of hospital days (10.3) but, unlike the California room and board fees, Alabama's short confinements were reflected in average room and board fees 17 percent lower than the U.S.

Clear-cut reasons for geographic variations in charges and lengths of stay for major surgical procedures continue to elude investigators. Continued research efforts are needed to discover whether cost

differentials are due solely to varying geographic practice patterns, as many argue, or to a combination of medico-socioeconomic or cultural factors.

Coronary artery bypass graft surgery remains a multibillion-dollar-a-year industry in this country. Thus, increasing attention will be paid to monitoring costs and evaluating benefits of the "most commonly performed major" surgical procedure in the United States.^{15,16} Interest also will be

directed toward further improving technology and techniques to better serve the changing CABG referral base. Cost containment among the sicker and older CABG patients, with their propensity for more complications and longer confinements, is the challenge being faced by economists and practitioners, alike.^{10,17} □

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Anti-Arthritic Medication Usage: United States, 1991

RECAP

Anti-Arthritic Medications

In 1991, about 70.3 million prescriptions for nonsteroidal anti-inflammatory drugs (NSAIDs) were filled across the United States to treat arthritis and related musculoskeletal problems. The retail costs exceeded \$2.2 billion in 1991 and were 6 percent higher than the costs in 1990 despite a 2.2 percent decrease in volume of prescriptions written. Per capita consumption averaged 278.6 prescriptions per 1,000 population with substantial variation by state. Kentucky led with 380.9 per 1,000 population and the District of Columbia had the lowest rate, 177.0. Ibuprofens were the most frequently prescribed class of NSAIDs, with Motrin capturing 20 percent of this generic class. Naproxen (Naprosyn) was the second most frequently prescribed class accounting for 19 percent of the NSAIDs. □

Arthritis and related musculoskeletal disorders are the most "frequently reported" causes of adult impairment in the United States. An estimated one in every seven persons, or around 37 million* Americans, are said to be affected by arthritis, alone.^{1,2} And among U.S. adults, approximately 32.6 percent are reported as suffering in some way from it or related conditions.^{1,3} The 1990 rate for arthritis (all ages combined) was 125.3 per 1,000, ranking it second only to sinusitis in chronic disease prevalence.⁴ Despite a slight decrease in the rate (1.6 percent lower in 1990 than in 1989), arthritis continues to be a major cause of disability in this country, with estimated costs exceeding \$10 billion each year.⁴⁻⁶ Arthritis remains a large economic as well as a medical problem and one that can, if not treated early or properly, lead to serious deformity and crippling.^{5,6}

Arthritis is not a new condition. It has been around since before the beginning of recorded history. X-rays of Egyptian mummies taken in the 1960s revealed that Ramses the Second, ruler of the Nile from 1304 to 1225 B.C., had severe arthritis of the hip.⁵ Today, it is still a widespread chronic illness, one identified with discomfort, disability and deformity. It is also one of the more baffling chronic conditions because there are no known causes for most forms of the illness.^{5,6}

While arthritis prevalence increases with age, children and young adults are also afflicted.² It can affect almost any joint in the body, and multiple joint involvement is quite common.³ Among the 100 or so forms of arthritis, osteoarthritis and rheumatoid arthritis account for

* The National Arthritis Data Workgroup estimate corrected for multiple diseases and applied the 1989 U.S. Bureau of Census population estimates.¹

about half of the cases; gout, systemic lupus erythematosus, scleroderma, juvenile arthritis and other forms making up the remainder.^{1,2} Osteoarthritis is by far the most common and, fortunately, the less severe form of the condition—it accounts for over 40 percent of all diagnosed

Arthritis is neither a fatal illness nor a new condition, having been around since before the beginning of recorded history.

arthritis conditions. Most forms occur more frequently among women but the prevalence is higher among men under age 45.¹ Arthritis is more common among poorer people and persons living in rural areas than more affluent or urban residents.^{1,3,5}

Treatment for most arthritic conditions primarily relies on analgesic or nonsteroidal anti-inflammatory drugs* (NSAIDs), but exercise, rest, weight control, joint protection and surgery—hip or knee replacements—are also used to help alleviate pain and increase mobility.^{2,6,7} While aspirin is the most common form of drug therapy, many prescription drugs are currently available and/or being developed. Such drugs are increasingly being recommended as part of the fight to control arthritis pain, particularly as more and more people are found to be sensitive to aspirin and its compounds.

* Corticosteroids, gold salts, penicillamine, antimalarial drugs, and drugs that help suppress the immune system are also used in selected instances.²

MetLife Study

As part of its series on prescription drug usage across the country, MetLife reviewed 1991 patterns of NSAID use. Data on prescribed systemic anti-arthritic medications were abstracted from the 1991 National Prescription Audit (NPA) and the 1991 National Disease and Therapeutic Index (NDTI). These two data sets are among a variety of pharmaceutical marketing databases compiled, maintained and analyzed by IMS America in Plymouth Meeting, Pa.^{8,9}

A detailed description of these two data sets is provided in the first in this series of articles (SB, Vol. 71, No. 4, 1990). Briefly stated, however, the NPA was established

Approximately 70.3 million prescriptions for NSAIDs were recorded in 1991, representing 3.8 percent of the total U.S. pharmaceutical market.

in 1952 and provides monthly estimates of prescription dispensing activities of more than 50,000 pharmacies. An estimated 90 percent of all new and refill prescriptions in the United States are covered in these audits. (These data are for prescriptions dispensed, not for the individuals receiving them.) The data are weighted and results projected nationally.⁸ The NDTI was begun in 1958 and collects data on a quarterly basis about private patients diagnosed and treated by a panel of over 3,000 randomly selected, office-based physicians. The accumulated data are extrapolated to a national level and combined to create annual summaries.⁹

Table 1—Selected Anti-Arthritic Medication: Prescription and Over-the-Counter Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) and Percent Change in 1991 For Generic Classes of Prescription Drugs

Generic Names	Selected Brands	Percent Change in Generic Prescriptions 1990-91
Aspirin Compounds (Acetylsalicylates)	Anacin, Bayer, BC Powder, Bufferin, Excedrin, Ecotrin, Zorprin	NP
Non-aspirin Salicylates	Arthropan, Disalcid, Magan, Trilisate	NP
Auranofin	Ridaura	-19.1
Diclofenac	Voltaren	-10.7
Fenoprofen	Nalfon	-24.8
Flurbiprofen	Ansaid	14.5
Ibuprofen	Motrin	-5.4
	Advil, Medipren, Nuprin	NP
Indomethacin	Indocin	-6.7
Ketoprofen	Orudis	1.1
Meclofenamate	Meclofen	-24.2
Methotrexate	Rheumatrex	31.7
Naproxen	Naprosyn	4.7
Phenylbutazone	Butazolidin	-18.3
Piroxicam	Feldene	-7.1
Sulindac	Clinoril	-17.1
Tolmetin	Tolectin	-16.2

NP = Non-prescription

Source: Adapted from Arthritis Foundation, 1990, reference #2 and IMS America; percentages computed by personnel in the Health and Safety Education Division of the Metropolitan Life Insurance Company.

Nonsteroidal, Anti-Inflammatory Drugs Used

NSAIDs are available either by prescription or over-the-counter. These drugs include aspirin and aspirin-like compounds and are used to help reduce the inflammation

associated with arthritis and related conditions.² Frequently these drugs are prescribed first in the course of treatment because of their relatively quick results and mild side effects. Examples of some of the more common prescription and non-

Table 2—Selected Demographic Characteristics of Patients Prescribed Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) United States, 1991

Age Group	Percent Distribution		
	Men	Women	Total
0-4	0.1	0.0	0.0
5-14	1.1	0.9	1.0
15-24	8.1	6.3	7.0
25-34	15.1	12.1	13.3
35-44	18.6	15.0	16.4
45-54	16.5	14.5	15.3
55-64	15.3	15.5	15.4
65-74	16.0	20.4	18.7
75-84	7.8	12.2	10.5
>84	1.4	3.1	2.4

Age Group	Men	Women	Total
Patients (1,000s)	20,353	30,189	50,542*
Percent	40.3	59.7	100.0

Race/Ethnicity	Number (1,000s)	Percent
White	43,018	79.7
Black	5,961	11.0
Latino/Hispanic	2,007	3.7
Asian	601	1.1
Other	262	0.5
Unspecified	2,145	4.0
Total	53,994	100.0

*Excludes 7 percent with unspecified gender and/or age.

Source: IMS America, *National Disease and Therapeutic Index*, National Prescription Audit, 1991.

prescription NSAIDs are listed in Table 1. The following data analyses focus solely on prescription NSAIDs sold across the country.*

During 1991, approximately 70.3 million prescriptions for NSAIDs were recorded for retail pharmacies, food stores, etc., across the country. This total amounted to a 3.8 percent share of the drug market, with a retail value over \$2.2 billion. While the market share of NSAIDs has been dropping since 1989, when it was 4.3 percent of all pharmaceuticals, costs have continued climbing (Figure A). NSAID costs increased around 6 percent between 1990-1991, 5 percent between 1989-1990, but 11 percent between 1988 and 1989. Five generic classes of drugs comprised the vast majority (76 percent) of the systemic anti-arthritis, or NSAID, prescriptions in 1991. Ibuprofen accounted for 30 percent of the total NSAIDs with Motrin contributing 20 percent to this generic class. Of the top five generic classes of NSAIDs, prescriptions for diclofenac drugs decreased the most (almost 11 percent) in 1991 followed by piroxicam and indomethacin drugs, each down by approximately 7 percent (Table 1).

Five generic classes of NSAID drugs accounted for 76 percent of the prescriptions.

The patients' characteristics correspond to those in national studies of arthritis prevalence (Table 2). That is, the majority of the patients were women (60 percent) and they were significantly older than the men. More than one-third of the women were 65 years old or older versus one-quarter of the

men, and about two-thirds were 45 or older in contrast to 57 percent of the men. Almost 8 out of every 10 of the patients were white. Twenty separate diagnoses were associated with close to two-thirds of all the NSAID prescriptions (Table 3). Not surprisingly,

The majority of the patients were women—one-third of whom were over age 65, significantly older than the men.

osteoarthritis was most frequently mentioned, and accounted for 26 percent of the top 20 diagnoses and 16 percent of all listed diagnoses for NSAID prescriptions. When the six "sprains or strains... diagnoses" are combined, this diagnostic group ranked second in frequency. Unspecified arthropathies and rheumatoid arthritis followed with 12 and 10 percent, respectively, of the top 20 conditions.

Trends

The expansion of the database to include prescriptions filled at additional sites, such as food stores and the like, permitted comparisons of usage by state and an analysis of the 1990-91 changes in NSAIDs use (Table 4). Total NSAID prescriptions were 3.8 percent lower in 1991 than in 1990. Ibuprofens accounted for 37 percent of total NSAID prescriptions in 1987, 33 percent in 1989 and 30 percent in 1991. Pronounced decreases were evident for Motrin's share of the ibuprofen market, e.g., down from 43 percent of total ibuprofen prescriptions in 1987 to 28 percent in 1989 and 20 percent in 1991. In addition, the total number of Motrin prescriptions dropped 25 percent between 1990 and 1991. Prescriptions for the second most

* State comparison data include prescriptions filled in food stores and other sites in addition to those included in the trend analyses data.

Table 3—Percent Distribution of the Top 20 Diagnoses Associated With Nonsteroidal Anti-Inflammatory Drug (NSAID) Prescriptions, 1991

	Percent of Top 20 Diagnoses	Percent of All Listed Diagnoses
Osteoarthritis, unspecified	26.1	16.4
Arthropathies, unspecified	12.1	7.6
Rheumatoid Arthritis, NEC	9.7	6.1
Post Operative Surgical Exam	6.6	4.1
Enthesopathy, unspecified	5.9	3.7
Sprain & Strain (neck)	3.9	2.5
Lumbago	3.9	2.4
Pain in Joint	3.7	2.3
Backache, unspecified	3.6	2.2
Sprain & Strain (back, unspecified)	3.1	2.0
Sprain & Strain (lumbosacral joint lig.)	2.8	1.8
Myalgia & Myositis, unspecified	2.7	1.7
Sprain & Strain (lumbar region)	2.6	1.6
Gout, unspecified	2.4	1.5
Bursitis, other	2.1	1.3
Spondylosis of Spine, unspecified	2.1	1.3
Sprain & Strain (knee, leg, unspecified)	1.8	1.2
Sprain & Strain (ankle)	1.8	1.1
Synovitis & Tenosynovitis	1.6	1.0
Enthesopathy (elbow region)	1.6	1.0
Total	100.0	62.8

Source: IMS America, *National Disease and Therapeutic Index*, National Prescription Audit, 1991.

Table 4—Total NSAID Prescription Rate and Product Market Share by Geographic Area, 1991

Geographic Area	Rate Per 1,000	Percent Change 1990-91	Drug and Product Share (%)					
			Ibuprofen	Naproxen (Naprosyn)	Diclofenac (Voltaren)	Piroxicam (Feldene)	Indomethacin	All Other
United States	278.6	-3.8	29.7	19.1	11.0	8.5	7.4	24.2
New England	253.4	-4.8	33.6	21.6	9.8	7.6	8.5	18.9
Connecticut	234.0	-11.6	30.4	22.2	12.6	7.6	7.8	19.3
Maine	318.8	9.3	35.5	18.4	9.9	7.1	7.8	21.3
Massachusetts	238.3	-8.3	34.4	21.7	8.5	8.1	9.2	18.2
New Hampshire	292.4	14.6	34.4	22.8	9.6	6.8	9.5	16.8
Rhode Island	234.5	-0.4	30.7	23.7	9.6	8.0	8.1	19.9
Vermont	340.2	-6.7	39.3	19.6	8.9	5.6	6.9	19.7
Middle Atlantic	268.0	-6.7	30.4	20.3	11.4	7.6	7.3	23.0
New Jersey	260.5	-2.6	26.9	21.9	11.6	7.9	7.7	24.0
New York	259.6	-5.9	33.8	21.2	10.5	7.5	6.4	20.6
Pennsylvania	285.5	-9.9	27.9	18.0	12.7	7.6	8.3	25.5
East North Central	325.9	-2.8	30.8	18.8	11.6	8.6	6.8	23.4
Illinois	320.2	-2.7	32.7	19.6	12.1	7.4	7.9	20.3
Indiana	327.0	-3.8	24.5	18.4	13.1	9.6	7.5	26.8
Michigan	356.0	1.5	35.3	18.2	10.3	9.0	5.4	21.8
Ohio	319.1	-7.4	27.7	18.7	11.6	9.1	5.8	27.0
Wisconsin	296.3	0.4	30.9	18.6	11.3	8.4	8.9	21.9
West North Central	311.2	0.1	31.2	17.8	10.7	8.9	7.5	23.8
Iowa	351.2	-5.4	32.6	18.2	11.9	8.5	7.0	21.8
Kansas	336.1	1.4	29.0	16.5	12.3	8.9	7.0	26.3
Minnesota	250.0	2.8	33.9	18.6	9.7	8.8	8.0	21.0
Missouri	319.3	4.5	30.3	19.0	9.8	9.2	7.5	23.8
Nebraska	379.1	-3.2	28.4	16.3	10.1	9.1	8.4	27.7
North Dakota	247.7	-6.7	26.2	15.9	12.7	9.2	8.8	27.2
South Dakota	293.4	-7.9	35.2	14.0	10.9	9.6	6.5	23.9
South Atlantic	269.8	-6.3	27.5	18.4	12.1	8.3	8.6	25.2
Delaware	278.4	-4.8	27.5	20.8	12.7	6.7	6.6	25.7
District of Columbia	177.0	-17.1	32.3	24.2	9.3	4.9	9.6	19.7
Florida	270.2	-2.2	25.6	18.5	15.2	8.9	8.3	23.6
Georgia	303.6	-5.8	30.7	15.5	8.9	8.2	8.9	27.7
Maryland	206.3	-12.0	29.8	21.7	10.3	8.0	7.9	22.3
North Carolina	300.3	-4.0	26.7	19.3	12.2	8.2	9.6	24.0
South Carolina	283.7	-7.5	26.2	17.3	10.9	7.3	9.9	28.5
Virginia	236.3	-9.2	26.6	19.0	11.9	8.0	8.4	26.1
West Virginia	315.8	-16.9	30.8	16.9	9.0	8.8	6.0	28.5
East South Central	364.7	-4.4	29.8	15.7	9.7	8.4	7.8	28.6
Alabama	360.6	-9.2	23.2	17.8	10.1	10.1	8.8	30.0
Kentucky	380.9	-1.0	31.9	15.3	10.1	8.7	6.3	27.7
Mississippi	352.1	-0.2	28.2	14.5	9.6	8.0	9.7	30.1
Tennessee	362.6	-4.8	34.4	15.1	9.0	6.9	7.2	27.4
West South Central	279.5	-4.7	24.9	18.3	10.3	9.0	6.9	30.6
Arkansas	344.4	-9.5	29.8	12.4	11.5	8.7	9.0	28.8
Louisiana	352.3	-4.1	26.0	18.3	10.8	7.9	7.1	29.8
Oklahoma	312.6	-7.0	23.2	19.3	12.6	9.8	5.2	29.8
Texas	246.8	-3.1	23.9	19.2	9.4	9.3	6.8	31.4
Mountain	270.1	0.3	32.0	19.0	10.5	8.3	7.1	23.1
Arizona	273.9	7.5	35.2	19.8	9.9	5.9	7.3	21.9
Colorado	228.4	0.8	26.5	19.2	11.4	9.6	8.6	24.6
Idaho	335.2	-6.6	25.6	18.5	12.4	10.2	5.9	27.4
Montana	331.3	-14.7	23.1	20.4	11.2	10.3	9.4	25.7
Nevada	275.4	-0.2	27.5	21.2	10.5	9.2	7.0	24.5
New Mexico	217.6	-1.2	36.8	15.8	10.7	8.0	6.1	22.5
Utah	306.2	0.1	41.9	17.0	9.3	8.5	4.8	18.4
Wyoming	313.9	7.0	32.9	19.9	9.2	7.6	8.0	22.4
Pacific	211.8	-0.6	31.0	22.4	10.6	9.6	6.7	19.7
Alaska	185.6	-2.3	24.6	15.8	5.8	16.3	6.1	31.4
California	202.4	0.1	32.5	24.1	10.4	9.1	6.5	17.4
Hawaii	273.8	-8.9	26.6	15.9	8.9	8.7	10.5	29.4
Oregon	246.2	-1.4	25.7	19.7	10.9	9.7	7.9	26.3
Washington	235.3	-1.7	28.5	17.5	12.3	11.4	6.1	24.2

Source: IMS America, National Prescription Audit, 1991; rate and product share percentage computed by the Health and Safety Education Division of the Metropolitan Life Insurance Company.

frequent class of NSAIDs, Naproxen, on the other hand, increased slightly during the year (2.4 percent). While accounting for 19 percent of the 1991 NSAID prescriptions, this increase was not sufficient to offset the other decreases, however.

Across the country,
per capita prescriptions
for NSAIDs averaged
278.6 per 1,000.

Per Capita Consumption/ Geographic Variation

Prescription rate per 1,000 population is used as a proxy for per capita consumption. As seen in Table 4, the rate at which total NSAID prescriptions were dispensed differed significantly by geographic area as well as between states. Per capita consumption averaged 278.6 prescriptions per 1,000 population but varied by as much as 72 percent between geographic areas. The highest rate was in the East South Central area (364.7) and the lowest in the Pacific states (211.6). Only three other areas reported above average per capita NSAID use but the rate in the West South Central was only fractionally (0.3 percent) higher. The second lowest per capita consumption was reported for the New England area where the rate was 9 percent below the country's average.

Ever larger differences were evident between states. Per capita prescriptions were the highest in Kentucky where the rate was 37 percent above average and 115 percent above the lowest rate in the District of Columbia (D.C.). Nebraska and Tennessee were the only other states where per capita consumption averaged 30

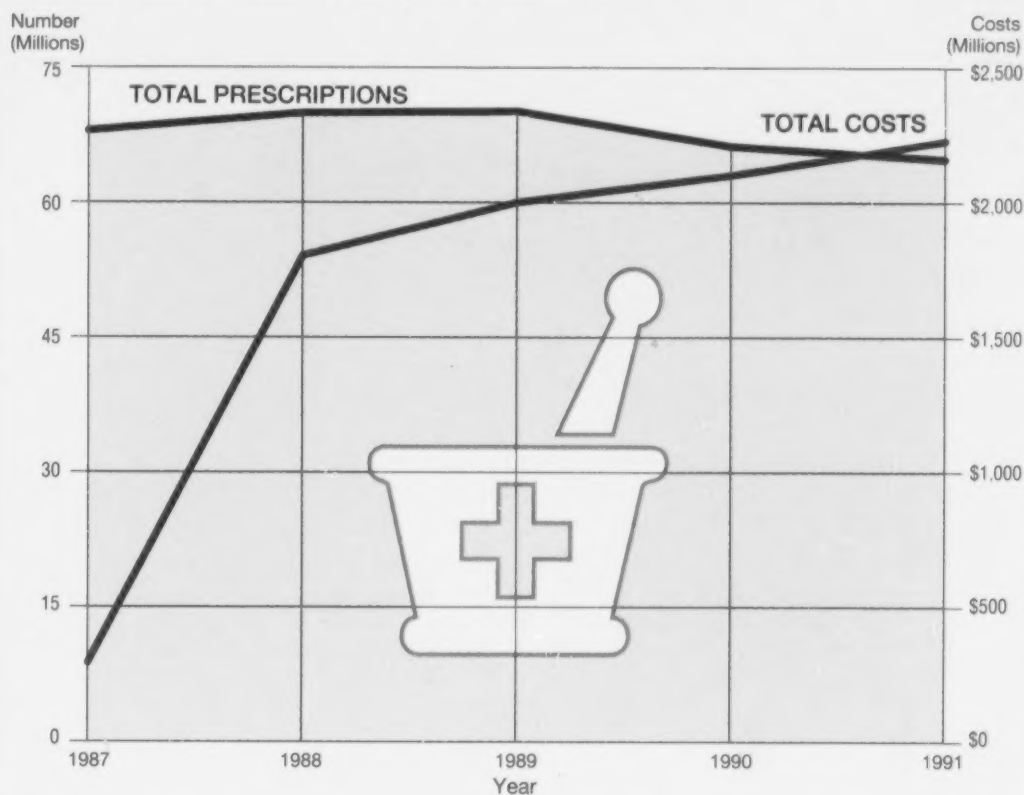
percent or more above the U.S. norm. Alaska registered a rate the second lowest, one that was 33 percent below the average for the country. This was followed by the rate in California which was 27 percent lower than the norm.

Between 1990 and 1991, NSAID prescriptions were down 3.8 percent. The decrease is not only an obvious reflection of the nationwide declining arthritis rates but also the fact that low-dose ibuprofen, principally Motrin, are now sold over-the-counter. In addition, drug sensitivity and the availability of alternative products may explain part of the decreasing numbers of NSAID prescriptions. Prescription volume was lower in 1991 than in 1990 in all but two geographic areas and 12 states. In the two areas with increases, however, the amount was hardly discernable, 0.3 and 0.1 percent, in the Mountain and West North Central areas, respectively. The decreases were more pronounced, ranging from almost 7 percent lower in the Middle Atlantic area, 6 percent in the South Atlantic area to 0.6 percent lower in the Pacific area.

The number and rate
of NSAID prescriptions
have been dropping
recently, with a 3.8 percent
decrease evidenced
between 1990 and 1991.

Per capita prescriptions increased by almost 15 percent in New Hampshire followed by a 9 percent increase in Maine. With the exception of Arizona and Wyoming, the increases were less than 5 percent in the other 8 states with higher

Trend in Nonsteroidal Anti-Inflammatory Drug Prescriptions and Associated Retail Dollars, U.S., 1987-1991



Note: Excludes prescriptions filled in food stores and other related stores.
Source: IMS America, National Prescription Audit, 1991.

1991 rates. The per capita rate decreased the most in D.C. and West Virginia with rates roughly 17 percent lower in 1991. Montana per capita consumption also declined substantially in 1991—down 15 percent from its 1990 rate.

There was a fair degree of uniformity in the class of drugs prescribed across

geographic areas. Ibuprofen was the NSAID most often prescribed and accounted for 30 percent of the drugs. This proportion ranged from 34 percent in the New England area to 25 percent in the West South Central area. Between-state variation was greater, however. Utah and Vermont had the largest proportion of ibuprofens prescribed,

42 and 39 percent of total NSAIDs, respectively. In contrast, Montana, Alabama and Oklahoma each had 23 percent of the total NSAID prescriptions due to ibuprofens.

Ibuprofen was the NSAID most frequently prescribed across the country. It accounted for 30 percent of these drugs in 1991.

As the population continues aging, as medical care costs continue rising, as increasing numbers of persons require health care and more persons demand improvements in the quality of their lengthening lives, it is expected that the costs associated with arthritis will become of greater and greater concern.⁵ The preceding data provide a cross-sectional analysis of the prescribing patterns for anti-arthritic (NSAID) medications in the United States. The data can serve as baseline measures for monitoring trends in use of specific products as well as generic classes, and for tracking costs associated with the medical treatment of arthritis. Research continues to explore the onset of this disease, the role played by genetics in its development, and to investigate new issues, for instance, the possible interaction of environmental and genetic factors associated with arthritis causation. It is anticipated that new ways to control and/or alleviate the pain will follow, aiding future progress toward better medical care of this common disease. □

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Letters to the Editor

A Better Definition of "Accident Mortality"

The article, "Major Causes of Accident Mortality Among Children," in the January-March 1992 *Statistical Bulletin*, is commendable because it focuses on a subject that receives too little public attention. I would like to make two comments. First, "accident mortality" is not the *fourth* most common cause of death as highlighted on page 4, but the *third* most common cause. Age-adjusted data provide the best measure and, in 1986, according to the National Center for Health Statistics, the age-adjusted death rates per 100,000 persons for the five most important causes were: heart disease, 175.4; cancer, 132.5; unintended injuries, 35.5; cerebrovascular disease, 30.4; chronic lung disease, 18.5 (*Amer. Family Physician* 1990; 42:680-686).

My second comment is that the category, "accidental injuries," like diseases, may be described in terms of basic clinical and epidemiologic variables, such as the responsible agent, range of tissue involved, pathophysiologic consequences, duration of onset and time required for recovery, case-fatality ratio, death rates and trends,

contributing behavioral or environmental factors, trends over time, and prevention. Since our knowledge definitely is increasing about the important determinants of injuries, I believe we should no longer consider them to be "chance occurrences" or "events due to unavoidable or unknown causes," which, according to the dictionary, are among the characteristics of "accidents."

An "accident" may be defined as an event that occurs in a random fashion, such as the selection of a number from a table of random numbers. We certainly would not talk about "accidental influenza," and, in the same sense, I believe we should not refer to "accidental injury" nor to "accident mortality." □

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Editor's Reply

We thank Dr. Doege for his thoughtful letter. He raises two significant points regarding *SB*'s recent article, "Major Causes of Accident Mortality Among Children: United States, 1988."

Deaths from injury have not been controlled to the same extent as cardiovascular and stroke deaths. In terms of *total deaths*—which *SB* reported—injuries are the fourth leading cause. We agree, however, that when *age-adjusted death rates* are used, this category becomes number three.

We also agree that "accidental" deaths are "not due to unavoidable or unknown causes"—an interpretation that "accident mortality" could imply. Rather, they occur statistically within established epidemiological parameters, i.e., demographic, geographic, and behavioral. Therefore, in the future, although NCHS uses ICD-9 nomenclature "Accidents and adverse effects"—Codes E800-949—*SB* will identify it by the term, "unintentional injuries," when referring to this category of deaths. □

STATISTICAL INFORMATION, PLEASE

Q *For which of the 10 leading causes of death is the gap narrowing between males and females?*

A For seven of the 10 leading causes of death, the disparity in male/female ratios narrowed considerably in recent years. When the ratios of age-adjusted death rates for 1979 and 1989 were compared, it was seen that the gap between the sexes narrowed for the top six causes of death, namely, diseases of heart, cancer, cerebrovascular diseases, unintentional injuries, chronic obstructive pulmonary diseases, and pneumonia and influenza, as well as the tenth, homicide. For diabetes, suicide and chronic liver disease, the disparity in rates widened. The gap has narrowed most for chronic obstructive pulmonary diseases and allied conditions.

Q *How does unintentional injury mortality compare with cancer, diseases of the heart and stroke in numbers and years of potential life lost (YPLL) before age 65?*

A In 1989, the top four causes of death were responsible for over three-fifths of the total deaths and almost a half of the YPLL for persons under age 65. Unintentional injuries ranked third (under half the cancer death total), yet their average YPLL was greater than any other cause. Because most unintentional injury victims are younger than those from the three other leading causes of death, the average YPLL per death was at least 2 1/2 times the other categories.

The following table gives the YPLL and ranks the four leading causes of death.

**Years of Potential Life Lost (YPLL) Before Age 65, By Cause
United States, 1989**

Rank*	Cause of Death	Persons Dying Before Age 65	YPLL (1,000s)	Average YPLL per Death
	All Causes	612,678	12,339	20.1
1	Cancer	159,946	1,832	11.5
2	Diseases of Heart	129,899	1,411	10.9
3	Unintentional Injuries	68,196	2,235	32.6
4	Stroke	18,891	238	12.6

*Based on total number of deaths before age 65.

Source: National Center for Health Statistics and *Morbidity and Mortality Weekly Report*, 41(18): 1992.

**Coming
in Future
Issues**

U.S. Smoking Habits, 1990

Occupations and Smoking

Decennial State Population Changes by Age

Views on Health Care Reform

Historical Perspectives

The age dependency ratio is an important population measure that shows the relationship between working-age and traditional nonworking-age people. It usually relates the total number of people under age 18, plus those 65 and over, to the population aged 18-64.

In the United States, mainly because of a lower birthrate, the overall age dependency ratio declined since 1960,

a trend that's expected to continue through 2010. After that year, when the Baby Boom generation reaches retirement age, an increasing elderly population is expected to reverse that downward trend. By 2030, the elderly dependency ratio will be larger than the youthful ratio, constituting a dramatic change from 1990, as shown in the figure which presents the ratio of dependents to workers, 1950 to 2050.

**Ratio of Dependents to Workers Aged 18-64
United States, 1950-2050**

